COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper – Second-class postage paid at Chicago, Illinois

Vol. V No. 29 | July 21, 1971 | Price: $9/year

GAO Report Hits Software Dollar Waste

By Don Leavitt
CW Staff Writer

WASHINGTON, D.C. – Federal agencies are spending nearly $3 billion a year for software but they don't have any centralized direction or guidance in what they're doing.

The result is often duplication of effort or purchase of programs already available elsewhere in the government, the General Accounting Office states in a recent report to Congress.

The "overly protective provisions" of IBM's licensing agreement for program products are also sharply criticized as sources of "substantial and unjustifiable" increases in the cost of acquiring software.

The report attacks the IBM policy of licensing programs on a specified CPU basis, with no discount for multiple site use.

"There is a need for the government to adopt a policy against this software pricing concept and to consider the alternatives that are available to it," states the report.

Other software vendors provide price breaks for multiple installation use of their products, but even these cannot be used to the government's advantage, GAO says, without a master plan.

Federal users generally acquire software without being aware of what else is being done or is available within the government.

Agencies have acquired like programs at varying prices within a relatively short period of time, the report states.

They have used various criteria and techniques for the selection of software and also unnecessarily duplicated technical evaluations, according to the study.

The proposed master plan would include Federal Information Processing Standards to be developed by the National Bureau of Standards (NBS). Standard languages should be promulgated

(Continued on Page 4)

Braille for System/3

David A. Schwartzkopf, a partially sighted IBM programmer, has developed a way for small computers to print Braille characters. A Braille programmer feature for the IBM 3/10 RPG II compiler was developed by Schwartzkopf at the General Systems Division development laboratory, Rochester, Minn., under an IBM program that allows employees to work on innovative projects not connected with their regular work assignments. The feature is now available to IBM customers without charge.

U.S. Aid Balloons Intelligence Files

By Joseph Hanlon
CW Staff Writer

WASHINGTON, D.C. – Intelligence data on potential troublemakers plays an important role in many of the new police computer systems, and collection and dissemination of such data is rapidly increasing, in part because of federal financial aid.

This aspect of police information systems is rarely discussed, but a picture can be drawn from a still confidential report of the Law Enforcement Assistance Administration (LEAA) [CW, July 14], as well as from material published by law enforcement groups.

The stress is on organized crime. But as the reports make clear, organized crime is more than just the Mafia – it also means political activists who organize to do things the police feel might be a crime.

As with the Army's computer data banks, these new systems surely contain data on people engaged in lawful, nonviolent protest.

By its nature, intelligence data contains hearsay and opinion, rather than factual material as is contained in criminal histories. A criminal conviction is not necessary for listing in an intelligence file.

660 'Militants'

Melvin Bockelman, data systems manager for the Kansas City Police Department, described such data collection at a meeting last November of Project Search (an LEAA funded project on a national criminal history system).

Bockelman said that filed in his computer is data on 600 "militants," including "all nationally known militants associated with Black Panthers," 35 "activists," and 2,480 other "organized crime subjects."

"Intelligence subjects" are filed in two categories, local and national, he said. But he would not explain in a CW interview where the department obtains its lists of national intelligence subjects.

One possible source is the FBI security index, which, according to the *Washington Post*, contains a list of 10,000 suspected subversives to be picked up in the event of a national emergency.

$6 Million for Intelligence

LEAA makes block grants to states based on size of population, and discretionary grants for special projects. The secret LEAA report is the first summary of the size and use of such grants in the information area.

Nearly $6 million in discretionary grants has gone to projects involving intelligence gathering in the past two years, the report indicates.

Further, the trend is toward intelligence systems. In the first year of discretionary grants (1969), only 20% of the grants for information systems involved

(Continued on Page 4)

Replaces 360/30

22 Saves First User $2,000/mo

NASHVILLE, Tenn. – The first user of IBM's 360/22 likes it. Installed in 2-1/2 hours, no downtime in over a month of use, no reprogramming, and $2,000 a month cheaper – that sums up Billy D. Gray's impression of the stripped-down 30.

Gray is president of Accountant's Computer Services, which ran its general business programs on a 30 before the conversion. As a result there was no reprogramming involved in the changeover. Gray said he had found no degradation of performance, since he was using 2311s and 2401s, fairly low-speed peripherals that run well on the 22.

Taking out the 30 and plugging in the 22 took place between 9:00 and 11:30 on June 8, Gray said, and the computer has been "running wonderful" ever since. Both machines came with 32K memories, and operate under DOS.

Accountant's is logging about 300 meter hours a month, Gray noted, averaging over two shifts a day. While there has been a lot of interest in the new machine from other users, there have been no complications at all from being the first customer for the 22, he added.

The switch has saved Accountant's about $2,000 a month in rentals, Gray noted.

Phone Billing Credits Can Help Data Users

By Ronald A. Frank
CW Technical News Editor

HANOVER, N.H. – Although telephone line outages caused by strikes or equipment malfunctions are a serious problem, some data users have learned to make the best of such situations by claiming service credits on their monthly phone bills.

One large user, the Dartmouth Time-Sharing System, has developed a detailed trouble reporting system in cooperation with local telephone representatives.

Designed to pinpoint line outages and accurately report out-of-service conditions, the system can determine the types of data lines involved, equipment affected, and most importantly the duration of service problems.

When a line problem is discovered either at a remote site or at the Kiewit Computation Center here, a special Dartmouth number is dialed to give an operator the pertinent information.

The operator immediately fills out a special repair order developed by Dartmouth and the local Bell office. The form includes the time the problem was discovered, the time at which it was reported to the telephone company repair service, the exact location, nature of the trouble, and other pertinent data to help solve the situation.

A copy of the form is sent to the local phone company which uses the information as a basis for correcting the out-of-service condition. When the trouble has been found and corrected, the phone company returns the repair order to the Dartmouth center with added information noting the type of trouble found, and the exact time when service was restored.

With the exact duration of the outage available, Dartmouth officials can determine the length of time that can be claimed as a credit on the next monthly phone bill.

All telephone tariffs contain a clause detailing the amount of minimum outage time required before a data user can claim service deductions from his bill. So claims for service outages require only a knowledge of the applicable instrastate or interstate tariffs, and an exact accounting of total service downtime, according to Thomas Byrne, assistant director of the Kiewit center.

The key to a succcessful credit claim is an agreement between the user and the phone company on the exact downtime, he noted.

It may be more difficult to exchange trouble reports with the phone company in large city areas, Byrne said, but the local phone company will usually not contest claims for service outages if they are correctly documented, he said.

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CDC Denies All Charges, Files CCS Countersuit

By Edward J. Bride
CW Staff Writer

ATLANTA – Control Data Corp. (CDC) has denied all the charges in the $8 million malpractice suit filed by a customer of its data center here [CW, July 7].

The big mainframe maker has also filed a counter suit which seeks to collect $27,151.48 allegedly owed by the customer, Computer Credit Systems, Inc. (CCS).

CDC said it had performed "in accordance with its contractual obligations," and that any damages, should they be awarded, must be limited to the fees actually charged under the original contract.

The damages, CDC said, are "excluded, limited and barred" by a limitation of liability clause in the basic contract.

CCS is seeking $5 million in alleged actual damages, $1 million in indemnification from lawsuits of its own credit bureau customers, and $2 million in exemplary damages against the defendant.

The original suit, filed in the U.S. District Court here, claims the average monthly charges by CDC during the one-year agreement were between $8,500 and $10,000 per month.

The referenced clause in the contract says the data center's liability "shall in no event exceed the amount of the charges" for services rendered during the one-year arrangement. The clause is standard in most computer contracts, however, and courts are not bound to observe it in making any damage awards.

Failed to 'State Claim'

CDC's denial claims its customer had failed to "state a claim upon which relief can be granted."

The funds allegedly owed to CDC stem from "disputed charges" discussed in the original suit, wherein CCS says it was billed for "computer time used in correcting [CDC's] errors" and "other charges not justified by the contract."

Attempts to negotiate these disputed charges were unsuccessful, according to CCS, which said it did pay the "just charges for services rendered" while seeking adjustments of the remainder.

The two sides now enter the stage of taking depositions from parties involved, and preparing and answering lengthy sets of questions, as part of the "discovery" portion of the case.

White House 155 Is Secret

WASHINGTON, D.C. – The White House is "secretly" installing an IBM 370/155, according to the *New York Times*. Nobody will way what it's for, and both IBM and the White House decline comment on the whole business. Ever try keeping a 155 secret?

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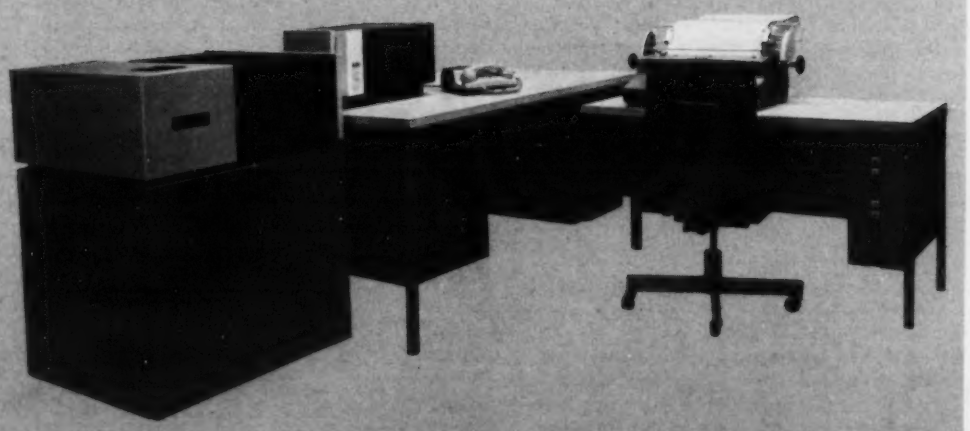

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FTC Investigating Using Credit Files to Clean Lists

By Joseph Hanlon
CW Staff Writer

WASHINGTON, D.C. – The Federal Trade Commission is investigating the practice by some computerized credit bureaus of using their records to cull poor credit risks from mailing lists.

Rather than "blacklists," the cleaned lists might be called "whitelists" because they contain only good credit risks.

An FTC spokesman said producing "blacklists" was a violation of the Fair Credit Reporting Act [CW, April 28], which prohibits sending information about a consumer to a company not involved in a credit transaction with that consumer.

It is not clear, the spokesman said, if removing names from a list would also be illegal under the Act, and the matter is being investigated.

$25 to See File

Other possible violations of the Fair Credit Reporting Act were described by Basil Mezines, FTC executive director, in a speech in New Orleans before the Associated Credit Bureaus.

While the act permits credit bureaus to charge "reasonable" fees when they show a consumer his file, he noted some credit bureaus are charging up to $25. Others are charging a fee merely to tell a consumer whether he has a file.

Interview Needed

Credit bureau "personnel are not freely explaining the full contents of the file," Mezines said. "It appears that many consumers must, in effect, interview the credit bureau employee in order to be told the nature and scope of information in the file."

"Blacklists" and "protective bulletins" are still being circulated, he said, despite the fact they are illegal. An FTC spokesman told CW the lists are generally circulated by smaller organizations, and there is no evidence that any are produced with the aid of computers.

Unified Management Approach to DP Aids Output

By Don Leavitt
CW Staff Writer

PITTSBURGH, Pa. – The importance of management's attitude toward data processing is strinkingly clear at the glass division of PPG Industries Inc.

The division in the past three years has installed 17 CPUs, largely IBM 360/25s and 30s, in plants across the country, and has implemented almost 20 applications, each custom-programmed by PPG personnel under standards set up at division headquarters.

The division has established its own six-week training course to meet increasing personnel needs from within the organization.

Before 1967, when the decision to install the hardware was made, the division had "effectively nothing" for DP work outside of the corporate computer center, a division spokesman said.

Although costs have been higher and savings lower than anticipated, the program is still considered to be making satisfactory progress. There is a 150% payback in cost of equipment and DP people per year, the division said.

Specifically, spokesmen note a CPU-based program is being used to plot the best cutting patterns for glass, with an estimated 3% to 5% improvement in yield.

In other areas they see a 5% to 10% in production efficiency and maintenance, which is now done on a pre-planned rather than emergency basis. A 20% reduction in stores and spare parts inventory has also been effected, PPG said.

Currently the system primarily provides support for local plant management, though all locations ultimately will be linked by teleprocessing to supply daily operations information to division management in Pittsburgh.

Actual production control through the use of IBM 1800 CPUs is being installed in some locations.

While the basic structure of each application has been standardized through division headquarters, the results are ultimately under the control of the local plant.

The form of the input, the editing and the updating routines and the layout of the master file in each case are fixed by headquarters. But the format of the reports and other printouts to be used by local personnel are left to the discretion of the local DP manager.

The glass division has about 100 people directly involved in DP. Each factory has three or four programmers and/or operators in-house while the corporate computer center, largely at glass division operations, has 40 or 45.

Integrated Use

Other divisions within PPG have received some carryover from the glass applications, a spokesman said. The fiber-glass division has direct use of the programs, while coatings and resins and the chemicals division have been able to adapt some of the procedures to their needs.

The PPG situation shows what can happen when a corporation embraces DP, builds from what it had, and considers the user in systems design, both in the elements that are standardized and in the report sections for individual plants.

DP May Cut Court Papers

TUCSON, Ariz. – The average state superior court case generates 387 pieces of paper, many of which are duplicated by other law enforcement agencies. Local officials feel computers could cut that total in half.

The Board of Supervisors has approved an application for a $250,000 grant to the Law Enforcement Assistance Administration, to be supplemented by about $100,000 in county funds, for the computerization of the county court records.

A defendant's file would be active from the time charges are filed until settlement is reached. Computers obtained under the grant would help schedule the court calendar and enable clerks to contact participants in civil action.

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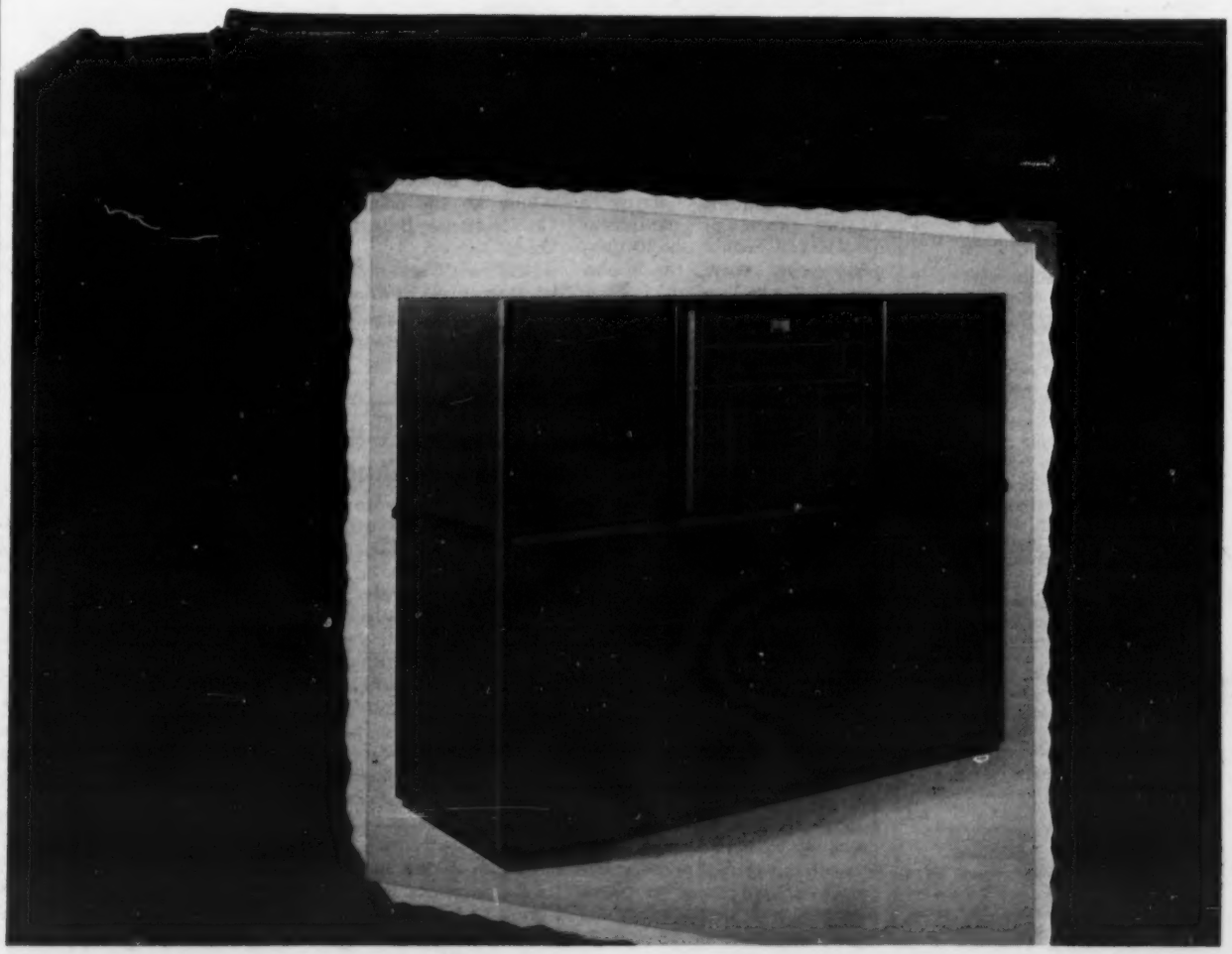

195 User Has 'Growing Pains'

By Thomas J. Morton
Special to Computerworld

ST. LOUIS – The first IBM 360/195 has been installed at McDonnell Douglas Automation here, but the automation company admits that everything is not running smoothly.

"Reliability," said Robert L. Harmon, McDonnell Douglas executive vice-president, commercial, "is not what it has to be."

Difficulties were expected, Harmon said, noting the troubles his company was having with the 195 were a combination both at McDonnell Douglas and IBM of inadequate experience with the large system and unproven software.

He also cited the lack of high-speed peripherals as part of the problem. "Running now," he said, "with existing units and software we are experiencing a 'cascading effect' with the 195."

He expects the troubles to be corrected within six months, he added.

"Our needs were both spatial and processing ability," he said, "and its eventual performance will overshadow the inconveniences of trying to make a .50 calibre machine gun work with .22 caliber ammunition."

The 195 is the first of two the company plans to install, according to William R. Orthwein Jr., McDonnell Douglas president.

The 195, Orthwein said, "represents a quantum jump in computing capacity because it has up to twice the processing capability of our next largest computers, the 360/85s."

8 Mbytes of Core

The 195-85 complex contains 8 Mbytes of central core, 12 Mbytes of drum storage, 2.88 billion bytes of disk storage, and a printing capacity of 6,600 line/min, a company spokesman said.

McDonnell Douglas has the 195, with its 4 Mbytes of central core storage capacity, on-line to five IBM 2314 disks. Through the 85, the 195 has access to seven more disks.

Three 2301 storage drums serve the 195, giving the system an additional 12 Mbytes storage capacity.

Also on-line are 28 IBM 2420 Model 7 tape drives, with the 195 having access to 28 more. One 1443 printer and one 1403 printer are in the system, with the 195 having access to five more 1403s. A 2540 card reader-punch, with access to two additional, complete the system.

McDonnell Douglas is presently using the complex for in-house assignments, namely the IMS (Information Management System) of McDonnell Aircraft Corp.

Milestone Near in Program Theft Case?

By Edward J. Bride
CW Staff Writer

OAKLAND, Calif. – A preliminary hearing in the criminal case of a programmer charged with theft by illegally accessing a service bureau's computer has been continued to July 30.

The hearing should result in either dismissal of the charges or referral to Superior Court for trial, said Richard Haugner, deputy district attorney for Alameda County.

Only two witnesses were heard on July 9, both from the plaintiff, Information Systems Design (ISD), which has accused Hugh J. Ward of stealing a proprietary plotting program [CW, March 10].

Two hearings were actually conducted on that date. In a civil suit filed against Ward's employer, University Computing Co. (UCC), ISD agreed to permit UCC to retrieve from impounded records a drum file containing customer information.

UCC is not charged in the criminal suit, but 29-year-old programmer Ward is charged with grand theft of the program, which ISD has valued at $15,000 to $25,000.

Last April, ISD obtained a preliminary injunction prohibiting UCC from using any trade secrets or other confidential information allegedly brought to UCC by Ward.

According to one legal source, the injunction also prohibited UCC from altering certain records cited in the search but not confiscated, and from altering the records of any phone calls made from early 1969 to the date of the injunction, April 12.

ISD alleges that Ward obtained the program by "tapping" that firm's computer over telephone lines by using an internal security code.

The UCC service center is located in Palo Alto. Both parties use Univac 1108s for remote batch processing, and the charges claim Ward needed the plotting program to help win over an ISD customer to UCC.

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EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160 (617-332-5606; TWX 710-335-6635). Washington: 1651 Winding Way Lane, Wheaton, Md. 20902 (301-942-4404). Europe: Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England (01-242-8908).

Second-class postage paid at Chicago, Ill. Published weekly (except: a single combined issue for the last week in December and first week in January) by Computerworld, Inc., 25 E. Chestnut St., Chicago, Ill. 60611. © 1971 by Computerworld, Inc.

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W. WALTER BOYD, *publication manager.* PATRICK J. McGOVERN, *publisher.*

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POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

GAO Hits Software Management

(Continued from Page 1)

for all software packages acquired for government use to ease transferability across a wider range of equipment models and reduce acquisition/development costs, the report says.

GAO also sees a need for more effective use of Federal Supply Schedule contracts and for use of the ADP revolving fund administered by the General Services Administration (GSA) to acquire generalized software packages for government-wide application.

"A catalog, inventory or central reference index of programs that have been developed, tested or in use by the government" is another "definite need," according to GAO.

This project was first proposed in 1967 but, at that time, GSA did not have the staff to implement it, the report said.

The Office of Management and Budget should provide the coordinated management and central policy direction for the Federal users, while the GSA should use formally advertised procurement contracts, and strive to obtain nonrestrictive agreements, the report says.

GSA should also maintain an inventory of software, but a reference index of the programs would be the responsibility of the National Bureau of Standards.

NBS would also make the technical evaluations for all federal users and promulgate the federal standards for languages and documentation, the GAO concludes.

$6 Million Grants Aid Surveillance

(Continued from Page 1)

intelligence gathering; this year all of them did, the report shows.

Many of the projects stress the dissemination of data, and some suggest that such data may be available outside of the criminal justice community. The New Jersey Special Services Bureau for Civil Disorders, for example, is developing a "tension detection unit" which will be available to "local municipalities, schools, colleges and universities."

Some of the funded projects stress increased intelligence gathering and "surveillance of individuals."

News Wrapup

Eastern Sees Settlement Soon

MIAMI – Eastern Airlines (EAL) and the Metropolitan Dade County Government have reached a tentative agreement on just what portion of EAL's computers should be considered tangible, and therefore taxable, property.

Attorneys would not disclose the terms of the settlement until a circuit court judge approves it.

EAL lost a 1969 appeal of its plant property taxes because of administrative reasons [CW, June 9], but the judge in that case stated computer software probably was not taxable. The big IBM user then filed the correct paperwork to appeal the 1970 assessment, which was based on the depreciated 1969 catalog price, including hardware, software, and services.

The 1971 assessment will undoubtedly be based on the tentative agreement, if the Dade County court approves it, according to a source close to the situation.

Former IBM Plaintiff Reaps Award

PHOENIX – The IBM customer who settled his unbundling suit out of court said he received "many, many times what I ever hoped to receive if we were successful in the class action," [CW, June 9].

The award was "confidential," said Everett Warner, president of Motor Replacement Corp. (MRC), but informed sources placed the settlement between $15,000 and $30,000.

Warner said he dropped the class allegations in the $5 billion lawsuit so he would not "preclude anybody else from instituting their own class actions."

Business and local governments had shown interest in MRC's suit, but "none was interested to the point of joining us," Warner commented, adding he was "disheartened" by this turn of events. "If somebody else is interested in this type of legal action," he added, "they can still do it."

Less Than One-Third Candidates Pass CDP

PARK RIDGE, Ill. – Fewer than one-third of the candidates for the 1971 Certificate in Data Processing (CDP) have passed the exam, according to the certification council of the Data Processing Management Association (DPMA).

Official DPMA figures show 869 of the 2,728 applicants passed the February test, bringing the total of CDP recipients to 11,938 since the exam was first given in 1962.

The exam covered five general areas, DP equipment, computer programming and software, principles of management, quantitative methods, and systems analysis and design.

South Carolina Installs Law Network

FLORENCE, S.C. – The state has begun installing a computerized law enforcement network, scheduled for message-switching in July and full record retrieval from the State Highway Department and FBI in December.

Governor John C. West predicted the computer terminal setup would enable law enforcement officials to "restrict criminal mobility" more effectively.

One of the chief benefits, the governor pointed out, will be protection against the "arrest or lengthy delay of innocent citizens stopped by police."

An RCA 1600 computer will perform the initial message switching functions, handling up to 7,000 messages a day, according to local officials. A Spectra 70/45 will be added next winter.

Army's Analysis Seen Askew on Moratorium

NEW YORK – Computer analysis of political intelligence did not work very well for the Army during the Oct. 15, 1969 Vietnam moratorium.

The *New York Times* obtained a 31-page printout of anticipated civil disturbances prepared by the Army before the moratorium. The *Times* called it "an essentially misleading estimate of a peaceful day of antiwar protest" which was a "haphazard mixture of rumors and fears . . . containing only a few solid nuggets of investigative reporting."

Among the inaccurate predictions was the statement that at the U.S. Military Academy at West Point "girl students from Vassar College . . . .will offer sex to cadets who sign antiwar petitions" and the claim that SDS planned to kidnap university heads.

The sorting program did not work as well as it might have: under the heading "nationwide" was contained the entry "entire nation spoken of in Chicago."

According to the *Times*, the printout "suggests that the Army's surveillance was even wider than the Pentagon acknowledged when it ended the program last year."

Executive Votes for People, Not Computer

NEW YORK – Claiming that people do a better job of running a company than computers, Jack H. Vollbrecht threw out computers linking nine major divisions when he became president of Aerojet-General.

"If you have good people who are motivated to do the job they have, nobody can beat you; nobody with a computer will beat an organization without one," he said recently in *The Executive Voice.*

Computers sap the motivation and intelligence of people who are in a position to make useful decisions and turn them into information processors, he noted.

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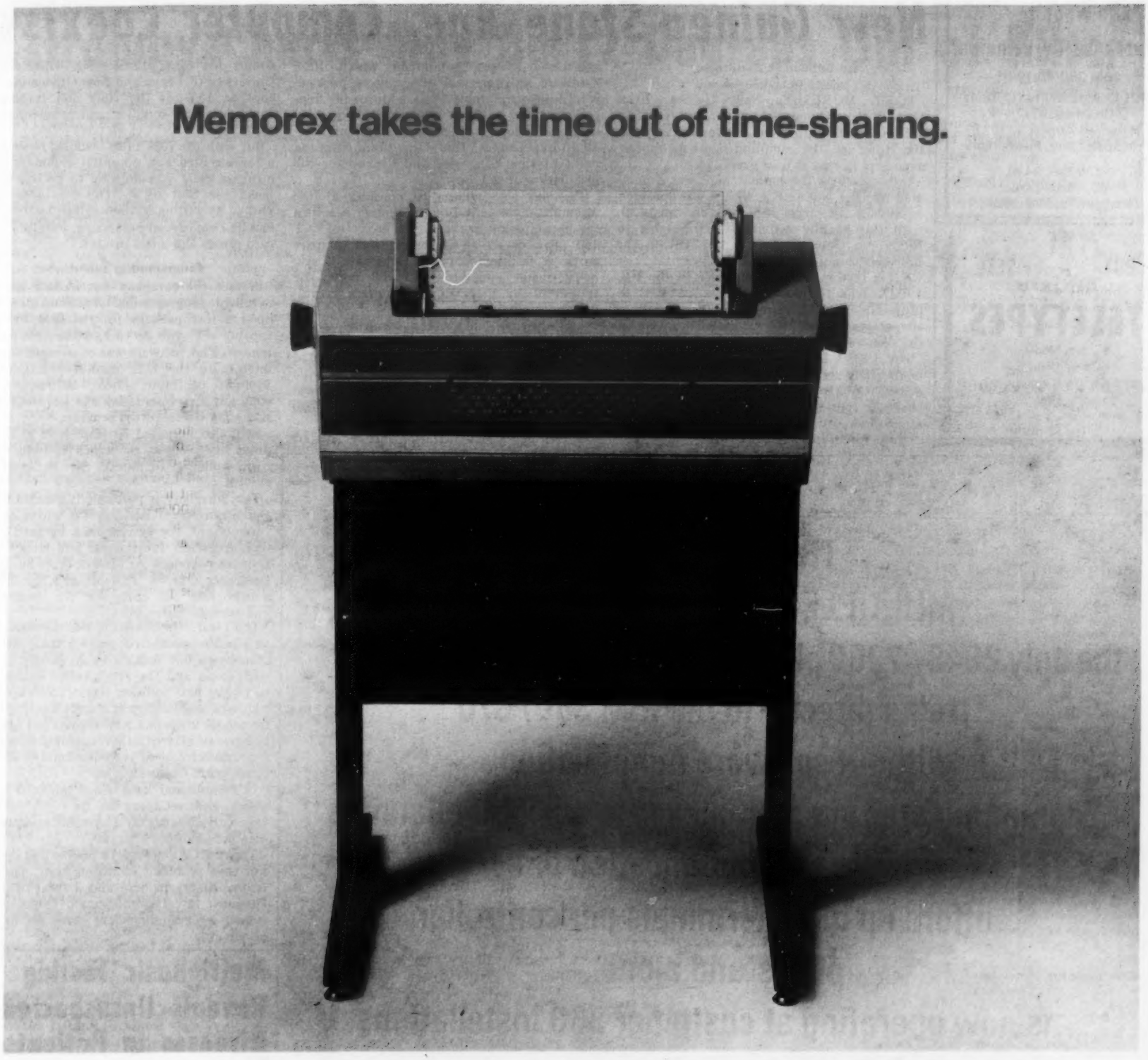

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New Guinea Stone Age, Computer Coexist

By Bohdan O. Szupriwicz
Special to Computerworld

PORT MORESBY, New Guinea – Even though New Guinea is one of the remotest areas on earth with many natives still living in the stone age, the computer made its appearance here as long as four years ago.

Until recently the market here was dominated by IBM, but an ICL 1902A was delivered to replace the single IBM system – an 1130.

All this healthy activity is attributable to Electronic Computers Pty. Ltd. (ECP), the only service bureau in the territory.

A big factor in the changeover to the ICL 1902A was the responsiveness of ICL to proposals put forward by ECP as well as advantages due to the "bundled" nature of the deal and availability of software packages.

The 1902A has the important advantage of being field enhanced. There are two disk drives, four tapes, a 600 line/min printer, 600 char/min punch and 1,000 char/min paper-tape reader.

"In a remote country like this," says Manager David Podger, "a company which offers hardware, software and service in one package is infinitely preferable." ICL additionally happens to enjoy a 70% market share in Queensland, Australia's northernmost state and nearest to New Guinea. This is important from the point of view of service and backup for the installation.

ICL was also willing to consider a 30% discount in the rental of the system in return for participation in the future profits of ECP and provides an on-site assortment of spare parts. A full-time computer engineer is also being made available who will partly be supported by Electronic Computers as production supervisor.

According to Podger, the company would have been better off if it originally began operations with a more commercially oriented machine. The choice of the 1130 was an unfortunate decision because surveying and engineering programming work is only a small percentage of the load.

Government administration processing accounts for 60% of all work while the University of Papua and New Guinea uses another 15% of the time and trading companies and building and engineering firms use 25%.

But with the IBM 1130 installed in such a remote area and potential commercial business there was nothing to do but to make the best of it. This was accomplished by writing considerable software to handle commercial processing, installing a card punch and a fast printer.

Programming Talent

In fact the company was blessed with excellent programming talent and developed a sort package for the IBM 1130 capable of sorting up to 1,000 records per minute. This software was of considerable interest to the U.S. market and DNA Systems of Flint, Mich., became the company's representative and has already sold sixty copies of the program.

ECP also managed to lease land at the university campus on which it built its own building to house the computer system.

The university is particularly pleased by this arrangement because it is within the campus and the sysfem may be used as demonstration to students and later for training purposes. At present there are no computer courses available and the university uses the computer for research and administrative work.

The local administration and the university both considered getting their own computers but neither could justify the cost alone and the arrangement appears to be the best solution for all concerned.

Service and backup is always a problem in remote areas like New Guinea not only because of lack of other machines locally but also infrequent communications with other parts of the world.

ECP protected itself from the start by hiring and retaining its own customer engineer who is also a systems programmer and analyst.

Today ECP employs 14 people and does not have problems recruiting staff. There is one American here and a total of six Papuans in the company. Three are trainee programmers and three are keypunch girls.

Multiphasic Testing Reveals Unsuspected Diseases in Patients

CINCINNATI – The multiphasic testing center at Good Samaritan Hospital here has been credited with revealing 50 diabetics and hypertensive people who were referred to the hospital for other reasons.

Dr. George Shields, director of medical systems at the hospital, said the federally funded project has enabled doctors to place 300 overweight people on weight reduction programs and to find several cases of elevated chlosterol, thyroid disease and breast cancer, "all among people who were not aware they suffered from these problems."

The hospital uses an IBM 360/40 to diagnose the comprehensive data, providing results to patients' doctors who have specifically requested the tests.

The hospital's computer also contains an extensive reference file of cancer and vascular disease case histories and treatments, and a program that automatically diagnoses abnormal electrocardiograms.

Good Samaritan Hospital will soon install an IBM 370/135 to serve the testing program and other projects, including the complete analysis of all laboratory tests throughout the institution.

Ultimately, multiphasic testing will enable the medical profession to move from an "acute care industry which treats people who are already sick" to one providing "comprehensive preventive care for more patients than currently is possible," he said.

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Horoscope Hunting?

Astrology Charts May Be 12 Degrees Out of Kilter

By Phyllis Huggins
Special to Computerworld

LOS ANGELES – What would you do if you planned your life by astrology and a computer professional suddenly revealed that the date on the planets has been off enough to cause you to come under different influences than those used in your personal charts?

This means that when you are advised to culminate a real estate deal on a certain day it may be possible that you should, for example, instead lie low and do nothing.

This shattering possibility was explained by Jerry Koory, president of Calculate, Inc., a DP consulting firm, and a 15-year veteran of computing.

He recently entered the business of doing calculations for astrology and believes that data now used by astrologers may be off more than 12 degrees for some planets. This can cause complete variances in the signs and planetary influences.

His analysis was based on data from the National Aeronautics and Space Administration (Nasa) tables used in figuring the moon landings and other space probes. He feels this is the most reliable data around.

Astrologers use tables called the ephemeris which have been used for many years.

Koory's next step is to get substantiations of his data from a couple of astronomers. He says he does not see how his calculations could be wrong.

Sidney Omar, a prominent nationally syndicated astrologer, was consulted about what effect this revelation would have on astrology. "If the data is off twelve degrees," he stated, "that is shocking." He added, however, "Astrology works. If it works with errors we had better stay with the errors." Warming up to the subject of astronomers he said, "They are the most useless people around. They're good for talking to junior high school students and that is about all."

Omar admitted astrologers know the tables are off slightly, but that this "has no significant effect." The completely disruptive fact would be Koory's findings as to the extent of errors.

A private astrologer who was interviewed had the same reaction as Omar. "Astrology has proven itself over and over again. These things have been proven. Astrology goes back as far as Adam and Eve and we use the same data as do astromoners and pilots. The planets themselves are in perfect order and never go out of form."

She added that astrologers try to make the individual a complete whole and to guard their health. "If they are off a little, it doesn't matter." Koory's reaction is that they should have the most accurate data available on which to base their interpretations. He doesn't claim to be an astrologer, just a computer professional.

The astrologers admit they cannot be as accurate as computers. The question, however, is whether people have been guiding their lives by erroneous interpretations.

The first step in figuring a person's astrology is the person's birthplace, date and time of birth. From that point 36 planetary positions in time are calculated.

A whole different set of calculations is also made to determine the angle of the planets which specify the three levels of influence; sun, moon and ascendency sign.

Astrology is estimated by observers as being a $40 million annual business in the U.S. alone and this estimate is considered conservative.

Published Nasa data used by Koory came from: *Principles of Guided Missile Design,* edited by Capt. Grayson Merrill, USN., and *Space Flight-Vol. I, Environmental and Celestial Mechanics,* by Krafft Ehricke. Publisher of both books is D. Van Ostrand,. Co.

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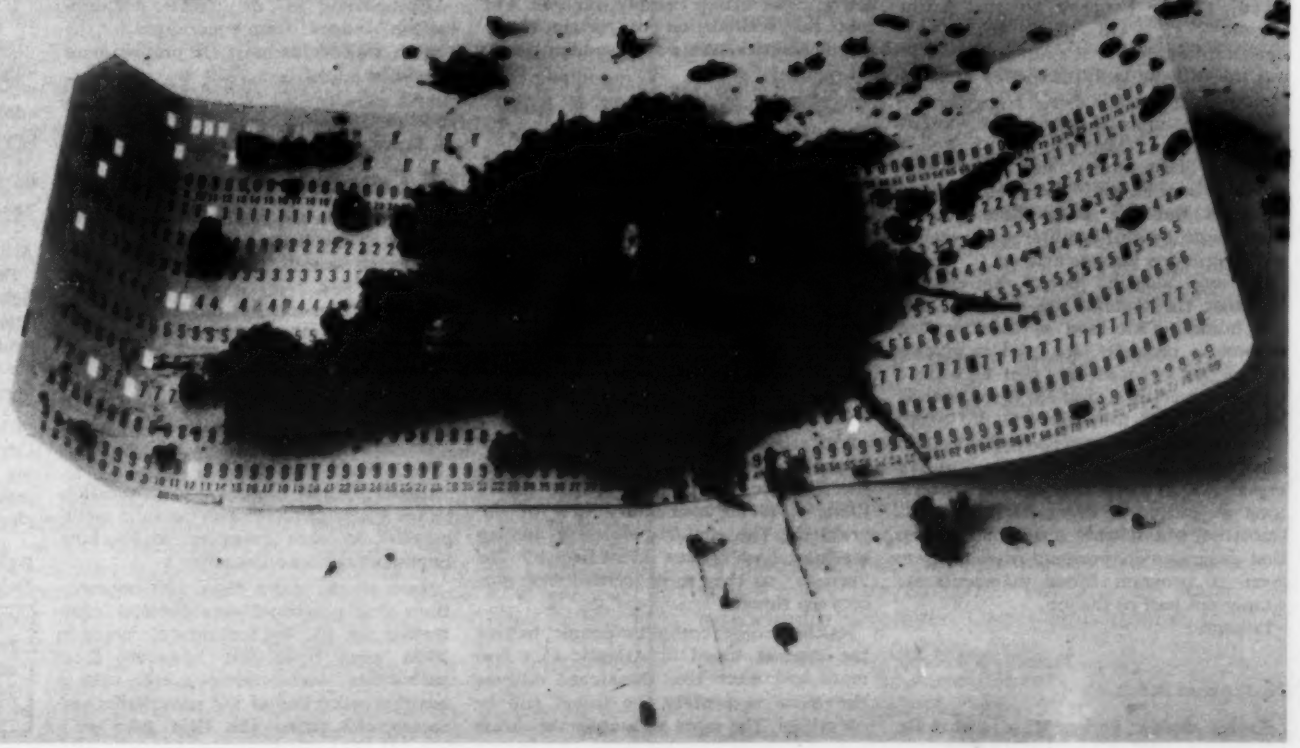


Editorial

Shooting the Innocent

An example of a system not properly designed to make the right "decision" is a loaded shotgun tied down and pointed at a doorway. When the door is opened, it triggers the gun.

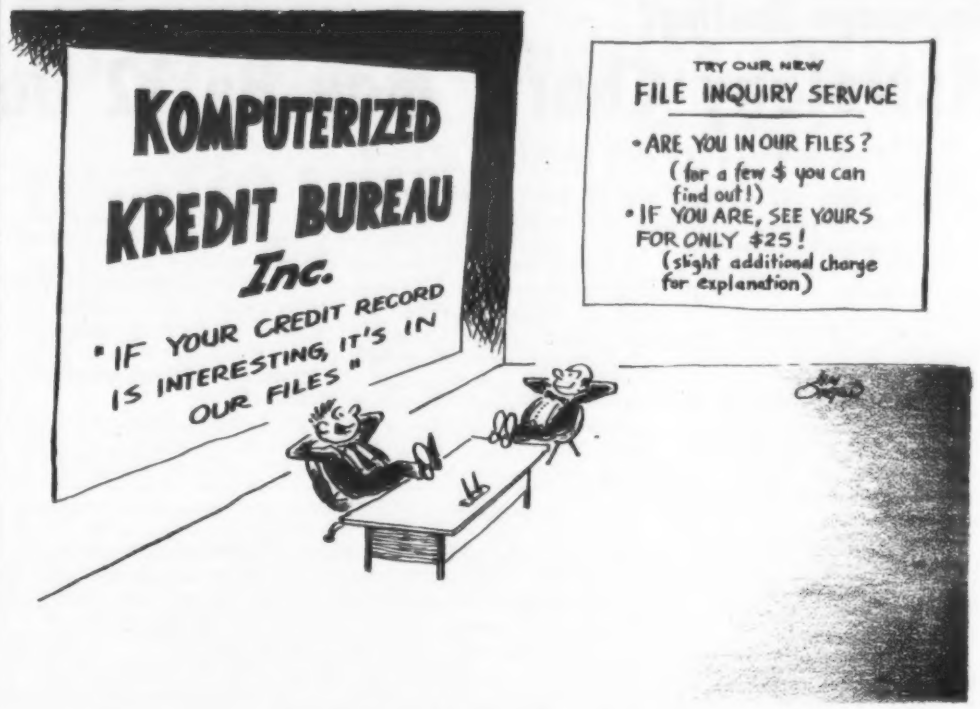
Since the trap is intended to shoot only intruders intent on burglary, it should be "programmed" not to shoot people entering legally or innocent intruders, such as small children.

Computer systems sometimes have the same fault. The system designer concentrates so completely on his main objective that he doesn't make adequate provision for protecting the innocent.

While such bugs may be excusable in new computer systems, there is no excuse for not removing them the first time the system "shoots" an innocent person.

An example is a billing system that makes no provision for properly crediting overpayments by customers. Twice we have heard of systems that simply kept the extra money without telling the customer.

If the computer community doesn't take careful pains to eliminate these problems, more and more restrictive laws will be passed.



'The Inquiry Service Is Doing So Well We May Drop Credit Reports'

Letters to the Editor

Student Finds Arrogance Taught in DP Classroom

I've come to regard Taylor somewhat as the Ralph Nader of the computer world, particularly with his articles on the theme of moral responsibility in system design.

Nader spoke of this kind of corporate arrogance as the "abuse of technology" last fall, while calling for a new generation of designers who can identify with something beyond the narrow goals of the corporation.

I came to realize the extent of this "arrogance" during a class lecture one day at the Honeywell Institute of Information Sciences when a Honeywell systems rep was explaining an accounts-receivable software package to our class.

At one point somewhere in the complexities of the flow diagram it became apparent that under certain conditions, customer overpayments and some round-offs were not provided for; but only in cases involving the customer's money, never the company's.

Several students noticed this independently and thinking that we had missed some branch, we raised our hands and asked, "What happens to that extra amount?" "... Oh, that's not a very significant figure ... it's just written off" was the offhand reply, as the rep went on to another point.

We were young and naive to the ways of the corporation; "But you don't write-off someone else's money, you only write-off your own money!" came our puzzled reaction. But our puzzlement quickly turned into cynical laughter as the reality of the situation became evident.

The most amazing part of that episode was that the systems rep did not share our humor. That kind of thinking had become so pervasive and total, so much a part of his environment, that he was no longer conscious of it at all. It was merely the obvious way to handle it.

In all fairness to Honeywell, I must add that this was not at all typical of my experience at HIIS although the general tone we picked up from our instructors (most of whom were a bit older) were that programmers program what they are given to program. Moral judgments are simply not part of the job.

I disagree.

Timothy Schoechle
Huntington Beach, Calif.

Taylor replies: Perhaps this is what Dr. Knowles was talking about at Babson College recently when he called for ethics to be included as part of management training.

Watson Ran IBM: Learson

An article by Michael Merritt [CW, July 7] implies that when Tom Watson Jr. returned to work after recovering from his heart attack, he spent his time engaged in trivial activities and let others run the business.

This is absolutely false. I work side by side with Tom Watson; and I can tell you from personal, daily observation that after his illness, as before it, he ran this business. As chairman of the board, he was not only the chief decision-maker; he was also the driving force behind our most important decisions. To say or imply otherwise is irresponsible journalism.

T. Vincent Learson
Chairman of the Board
IBM
Armonk, N.Y.

As chairman of the executive committee and a member of the management review committee, we assume Watson is still very active. The article simply pointed out that the reallocation of certain major responsibilities was not a sudden event. Ed.

'Perhaps We'll Hear a Roar'

I attended the "Image of the Industry" session at SJCC and was among those left with a sense of uneasiness [CW, June 2].

I shared the editorial's initial analysis of the uneasiness created by this session being attributable to the reversal of role. And then, I thought about the people behind those little voices squeaking in the audience. Sure they're computer people. They're also citizens who feel somehow threatened. It is irrelevant that one of the threats is borne by the industry in which they are employed.

I also agree with the analysis of the attitude of the panel, and as it stands now the "people," computer people among them, have an elementary view of the problem. The de-facto decision making machine hasn't been identified by the "people" so they're concerned with grocery list threats.

As the people, computer people, behind the squeaks heard in Atlantic City feel more and more like threatened citizens the more accurately the threat will be identified. The more accurately the threat becomes identified the louder the squeaks. Perhaps, at the next Joint, we'll hear a roar or two.

Joe Flaherty
New York, N.Y.

Reality Seen Beneficial

Your "What Problems" editorial boggles the mind [CW, June 2].

When the entire DP community decides to operate in concert to kill off the "giant electronic brain" myth and the public and top business management do begin to understand that "the computer ... is simply a tool that people sometimes misuse" we will be embarking on an era of reality that will benefit us all.

Too long has the public believed that "the machine" could perform miracles and "yakked" strenuously when it made a mistake. Too long have erring data control people blamed "the machine" for their errors of omission or commission. Too long has management expected the computer to make decisions for them, and been surprised and disappointed when "only" better, timely management information was delivered upon which to base a rational decision.

"Computers as de facto decision-makers" indeed! I am encouraged by the panel's attitude as most DP professionals should be.

A.F. Adolf
Ralston Purina Co.
St. Louis, Mo.

UK Census Problem Unsolved

An article on the British census controversy was excellent, but contained a few statements which distort the situation [CW, May 19].

The UK census form did not ask how many illegitimate children women had had. Quite the reverse, it asked only for the birth dates of legitimate children – for the sensible purpose of plotting birth rates so the National Health Service can have clinics and hospitals in the areas where they're needed.

Similarly, the immigration question (while badly phrased) may serve a useful purpose in such programs as teaching English as a second language.

Most of the more than 800 organizations that purchased or requested information for the last (voluntary) census in 1966 were bona fide hospitals, local authorities, social agencies etc. with a healthy sprinkling of DP consultants and commercial firms like IBM who were looking for demographic trends, not names and addresses. One was a large credit organization.

The real problem is still unsolved – re-writing programs so that the widely distributed data from the 1971 census will be fine-grained enough to be useful and coarsely agglomerated enough to protect individual privacy, an important concept of the British.

As the programs presently stand, some of the data will be broken down to 100-meter squares on the National Grid, which will penalize the people rich enough to cover a single square, but leave the crowded immigrant neighborhoods in perfect privacy.

Since the data won't be ready until 1973 there's a fair chance that the British Computer Society and the recent commotion will provide impetus to have the programs rewritten for commercial distribution of the data.

Nancy Foy, Publisher
Time-Sharing News
London, England

To Join or Not to Join...

I have been reading The Taylor Reports on the DPMA and am basically puzzled about his opinion of this association.

I am a young (25), career government employee, have an MBA from a mid-western university and work as a systems analyst for the National Guard Computer Center in Washington D.C.

I have one very basic question: Would it be to my benefit professionally to seek membership to this association?

Dan Maday
Arlington, Va.

Taylor replies: If you are interested in fighting hard to make it a professional organization, then there is no better training available as to what professionalism is really about.

Accounting Machine Needed

The National Farm Workers Service Center, a nonprofit organization, is looking for a 402, 403 or 407 accounting machine that could be donated as a charitable gift. Please contact me.

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Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

DP Professionalism Defined

When Will Taylor's 'War' With DPMA Be Over?

Last month, down in Houston at the 20th annual meeting of the DPMA, two questions were put to me that I was not able to answer. The first question arose at about 6 p.m., as 50 people were attending a gathering of CDP holders.

Someone in the back of the room asked, "Why should we be licensed? What are we licensed to do? I can see what doctors are licensed to do, and engineers, but if we are professionals what are we to be licensed to do?"

The Taylor Report
By
Alan Taylor, CDP

And no one had an answer for him! No one!

About three hours later, sitting in a pleasant courtyard having an after dinner drink, I was asked a more personal question – when would the "war" between myself and DPMA be over?

Now, mind you, I do not admit that I have got a war on with DPMA. DPMA, however, seems to think so, or at any rate its top hierarchy seems to.

Its rank-and-file – including rank-in-file International Directors, do not seem very worried, and on the whole seem to be supporting my efforts to get some truth into that organization.

Appearance of Vendetta

But to some my recent coverage does have the outward appearance of a vendetta, and so the question was a valid one.

It was put to me by someone who happens to know that I am actually very strongly in favor of the strengthening of DPMA, and that I am well aware of how much the society is needed by the industry.

What he was afraid of was that, by letting my various comments be characterized as an attack without end, I would be obstructing the necessary actions.

To that question – when the war with DPMA would be over – I did have an answer. When DPMA stops giving out false information, and when it stops breaking its own rules, and – as a somewhat lesser priority – when the election process of its officers becomes democratic instead of the "Free Booze, We Have a Gift For You" type of electioneering operations that I had been watching for the previous few days, then my war will be over. Instantly over.

DPMA Duty to be Professional

I did not have to explain too much about what I meant. My questioner knew that the membership figures claimed have never been achieved, and he knew that in the past DPMA had ignored specific rules that are to be found in its charter. He also knew that this unprofessional conduct was hurting the organization.

But what he was not expecting was that I should then half leap up in my chair and realize that I had the answer not merely to the DPMA war question, but also to the question on what data processors are licensed to do. Reasonably, because it is quite a jump.

Defines DP Professionalism

It turned out that what I was asking DPMA to do was quite simple. I was only asking it *to be able to be trusted with data!* Clearly, in my opinion, an organization of data processing professionals should be able to be trusted with data. That is to say any data it gives out should really be accurate and relevant.

I was asking it to be *professionally* responsible.

And that meant I had defined what professionally responsible was. *A data processor is professionally responsible if he can be trusted with data processing.* And there are two reasons why you do not trust people with data processing – when they are incompetent at it, or when, although they are competent at it, they are liable to produce wrong results.

And there is the answer both to the question as to what a data processing professional is, and when my war with DPMA will be over.

10 Year Battle

And it is not only my war against DPMA. Before I came to this country 10 years ago I was already having another war with the then leader of data processing, Univac.

I worked for it for some years in England and had the duty of understanding the technical material that I gathered over here, and the manuals, and instructing the programmers how to go about things.

Over a period of years I discovered that the manuals were not merely inaccurate, but that no one in the Univac operation cared. The final blow was a Cobol compiler which was supposed to need eight tape decks, and when I came over here I found that it needed 16!

It was not the lost sales that worried me, but the fact that nobody cared whether their information was correct or not.

I blew my top, and was asked why, if I cared that much, I did not come over here and do something about it. Three weeks later I was over here trying to do something about it. I failed, needless to say – but at least I tried.

When the 'War' Will End

In fact I have been trying to do something about this ever since. Not just for Univac, not just for the DPMA either. For everyone's sake. And my war with those people in the data processing profession, including the societies, the manufacturers, the users themselves, and anyone else will continue only until *such time as their data can be relied on.* For this I feel is the least reasonable standard.

It does not take much to make data reliable. It only takes the appropriate, fairly easy decision that data is supposed to be reliable.

Plus one other hard decision – that, when questions are raised, they will be answered, and not just pushed under the rug.

As for the users who put out bills that cannot be relied on, the associations who put out purposes and figures that cannot be relied on, and the computer manufacturers who put out performance statistics, proposals, and software documentation that cannot be relied on, my professional war will go on.

I will fight, just like any professional will fight, for the worthiness of *my profession and his profession – just that long and no longer.*

The war can end tomorrow or it may last the rest of my lifetime, I cannot tell. But I do know that I believe in the Data Processing Profession and will not give up responsibilities that this belief lays upon me.

For I *am* a professional.

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Taylor Thoughts

As a result of the letters of DOS users who want to stay with the IBM 450 Sort on 2311-style disks – and whose letters range all the way from supplication to demand that it be supported – arrangements have been made for support to be available. For details, please write to me.

2314 Question

The question of the 2314 is a little bit more complicated. Since 450 Sort originally came out a lot of people have added 2314-type equipment to systems which only have a certain amount of memory.

And clearly there is interest in having a 2314 version. In fact IBM produced one some years ago, and I find that although it withdrew support from it in 1968 the version has continued in successful operation since. Unfortunately we only have an object deck. This sort is called I-Sort, for intermediate sort. And it has worked fine for years.

Unfortunately DOS releases 24 and up do not support I-Sort, so we have the problem of a program that works, but now the operating system which allows it to run has been taken away from us.

There are a number of possible solutions, the main ones being either to patch 2314 input/output onto the 450 Sort, or alternatively to take I-Sort (which really is just a patched 450) and re-integrate it into the current operationg systems.

If you have a technique that can get 450 Sort up on current DOS with 2314, or if you have some documentation which might help, please write to me.

ACM Meeting Looks Good

At this point I want to praise ACM, a society which I have previously attacked quite as hard as I am attacking DPMA. For not only has it realized that pushing things under the rug, or misleading its members, is just not done, but in addition it has realized that the answer really is dialogue.

If you have dialogue, and if each side is prepared to answer the other, then you will be able to see whether the data is reliable.

In its next main meeting in Chicago on Aug. 3-5, ACM is talking about "The Decade of Dialogue" and is also arranging to have a lot of the old timers – who are still working in the field – available for dialogues (conversations) with people.

I think that it is an excellent idea, and I urge you if you are anywhere in the area to go. For dialogue is the answer to our professional problems, and the cost ($35 members, $60 nonmembers, free for unemployed professionals) is about the lowest I have ever seen for such a gathering.

Stolen Cars on File

CW European Bureau

WEST GERMANY – A police information system Polas at the State Criminal Police Office that deals with searches for stolen cars is the first step in the development of an extensive electronic information system.

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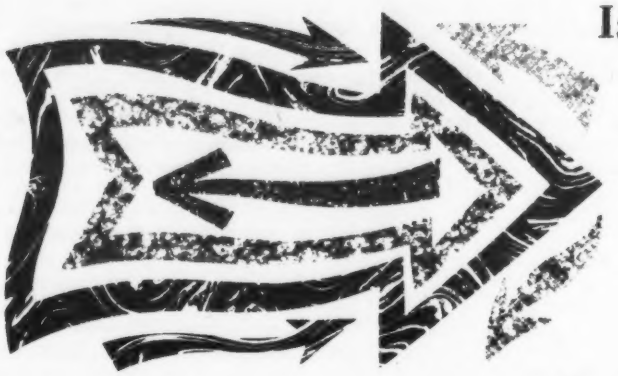

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Computerworld's editors will examine the ubiquitous mini in their Minicomputer Supplement – coming in the August 28 issue.

If your company makes mini's, mini peripherals, or mini software – or if you sell to mini makers or users – this Minicomputer Supplement is the opportunity to advertise in an exclusive mini marketplace.

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Random Notes

Dartmouth Cuts T/S Rates Adds 30 Char/Sec Service

HANOVER, N.H. – The average "pay-as-you-go" user will be paying 25% less for services under the Dartmouth Time-Sharing System, according to a recent rate announcement from the college. Users under DTSS fixed rate plans will not be affected.

While connect time, CPU time and storage charges are all down sharply on the new schedule, a charge for I/O activity will tend to offset the savings for some users, a spokesman said. He also noted that a 30 char/sec service is now available under DTSS.

'F0' Used for I/O Spooling With Latest 'Grasp' Option

EL SEGUNDO, Calif. – With the release of the 'F0' partition feature, users of the Grasp spooling system from Software Design Inc. (SDI) have all three standard DOS partitions available for multi-programming batch-oriented operations, the company said.

Grasp will also function with as many as eight subtasks in Foreground 1, in a multitasking environment, according to company sources.

The 'F0' capability adds $30 to the $400/mo charged for the basic Grasp package, SDI said, from 999 North Sepulveda Blvd., 90245.

Standard Cobol Library Used For 'Score-III' Definitions

NEW YORK – Users of an enhanced version of Score-III, a Cobol source code generator from Programming Methods Inc., are able to access their own Cobol source library for file definitions, rather than maintaining a separate Score library.

The revision is said to provide greater computational capability on control breaks as well as more entry points for the user's own programming steps. Score-III is currently available on IBM 360/370, RCA Spectra 70, Honeywell 200 and other CPUs, from 51 Madison Ave., 10010.

Bankcom Aids Personal Trusts

CHICAGO – Banks struggling to implement personal trust administration on in-house equipment can use a time-shared version of the application available on the Bank Computer Network (Bankcom).

Each implementation is completely customized to meet the user's needs, a network spokesman said.

The personal trust service can be used for paying employees of administered buildings, distributing dividends, voting proxies on securities held or paying college tuitions for beneficiaries, he added from 333 N. Michigan Ave., 60601.

Hospital Accounting on T/S Net

SUNNYVALE, Calif. – Hospitals are able to handle patient accounting, on a remote batch processing, fixed cost service developed by Alton Associates Corp. (AAC). It is expected to be available on a national time-sharing network shortly, according to AAC.

The Hospital Processing System is capable of handling inpatients, recurring and non-recurring outpatients. It stores charges as they accumulate and transfers them to an accounts receivable file for billing periodically or on patient release. AAC is at 505 W. Olive Ave., 94086.

Extends OS Supervisor

Package Monitors 360 Tape Library

By Don Leavitt
CW Staff Writer

DALLAS – IBM 360 users with large tape libraries operating under OS can have the CPU act as its own librarian through Tape Management Software (TMS) from Computer Technology Inc.

Effectively, TMS is an extension of the OS data management routines for tape data sets. It handles label checking and similar functions, but it also accumulates data on which tapes are available for scratch, which drives are causing errors and who uses each volume.

The system includes its own backup in case of a malfunction that eliminates the primary "library" records, CTI said.

Nine software routines that gather tape volume and data set status changes as they occur interface with IBM OS/360 Open and End of Volume modules. The TMS package requires a "hook" in the OS accounting routine if Job statement information is to be maintained with a volume's entry, a CTI source said.

The supervisory routines make use of a Tape Management Catalog (TMC), a data set that includes an entry for each tape volume to be controlled by TMS.

The disk-resident catalog is updated in place as processing cycles age the tapes through the grandfather-father-son sequence. TMC provides 23 fields of information about each entry.

As changes are made in the TMC, they are also recorded, sequentially, on another disk-oriented data set, the Audit Log. At the end of each day, the records are transferred to tape for storage.

The address of the next available record is reset to zero so that the next day's transactions can be recorded from the beginning of the disk file extents.

A third disk data set is provided with TMS to capture data from historical or reporting purposes.

A series of programs external to the OS Supervisor provide listings of all the tape volumes, in differing sequences, to highlight such areas as volumes out of the library area, or volumes having retention dates expiring within seven days.

The TMS supervisory routines are largely transient, CTI said, but do require 2K of main memory. The Link macro required to 'hook' into the accounting routines uses the same parameters as the normal JARS exit, a spokesman said.

TMS is available for $10,000 for the first CPU and for $3,333 for each related CPU sharing the access, CTI said from 1500 UCC Tower, 75222.

Load-and-Go 'Hart/OS' Creates Output from Dictionary, Cards

NEW CITY, N.Y. – Users operating under either DOS or OS/360 are able to generate multiple reports or other output on a single pass of data base, without conventional programming, with the Hart/OS information retrieval system from the Hayden Group, Inc.

The system is said to handle card, tape or disk files, having either fixed or variably formatted records. File organization is likewise not restricted by the system but may follow sequential, index sequential or direct access methods.

The data base used by the system may be made up of several individual files, Hayden said.

Output from the Hayden package can take the form of reports or other printed documents, punched cards, or tape or disk files, according to the company.

Since one pass can generate multiple outputs, users have the capability of printing mailing labels, for example, and of capturing the same name-and-address data on tape for later reruns.

To use Hart/OS the data base is first defined, in terms similar to those of a Cobol FD. The so-called dictionary defines the file or files in the data base and the characteristics, including reference name, of the fields within the files. The disk-resident dictionary becomes part of the Hart/OS system.

Hart/OS is written in Assembly Language and needs 32K of core storage under DOS. An OS implementation normally uses 65K but this can be modified, the company said.

The basic Hart/OS system sells for $6,500, from P.O. Box 320, 10956.

32K System Controls Inventory

PITTSBURGH, Pa. – IBM 360 users can have timely information on raw materials, manufactured and purchased components, shipping stocks and supplies, with a remote-batch oriented Inventory Control System (ICS) from Westinghouse Tele-Computer Systems Corp. (WTSC).

The 14 programs in the package are designed to accept multiple forms of transactions that affect inventory levels, perform various demand projections by item, and generate exception reports to highlight situations that require action by the user.

The system does not, apparently, issue stock reorders, but is capable of determining what the most effective reorder points would be, in terms of known and projected demand, suppliers' prices and discount schedules.

Written in ANS Cobol, the system has been implemented in 32K on a disk-oriented 360 under DOS. It can be run under OS/360 as well, or could be adapted to other CPUs that support ANS Cobol.

The package costs $25,000 which includes two man-months of on-site support. This could cover customization, education or implementation assistance. If additional customization is required it would be charged separately, WTSC said, from 2040 Ardmore Blvd.

Post Students Fed 'Pablum' To Understand CPU Concepts

GREENVALE, N.Y. – Beginning students of programming can get a sound understanding of what goes on inside a CPU at the binary coding level, without getting involved in details of circuitry, by using Pablum from C.W. Post College.

Programming in Absolute Binary Language for an Unsophisticated Machine (Pablum) is a computer language developed by Dr. Eugene Homer to replace conventional training languages such as Basic or Fortran.

The Pablum package is written in 1130 Fortran which means that the simulated CPU, and the student's programs, can be run on most CPUs that support Fortran.

The system, is however, 16-bit word dependent and would not be easily adaptable to CPUs having differing word structures. The college has not established a price for Pablum.

Packages Link 360, MT/ST

WASHINGTON, D.C. – Operations based on an IBM 360 and on Magnetic Tape/Selectric Typewriter (MT/ST) units can be merged through a series of programs available from P&M Resources. Though the programs are low-cost, most require a cartridge-to-tape converter to complete the 360-MT/ST interface.

Each package performs a specific form of conversion. One program copies and converts a tape from MT/ST to Ebcdic, Ascii, BCD or any other code specified at purchase time. Another program converts from user-defined code to MT/ST code on tape.

Each of the programs, written in Assembler Language, is available for under $25, from 1343 H. Street, N.W., 20005.

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Data Briefs

Service to Report Tariff Changes

RAMSEY, N.J. – Data users can receive rate and policy changes for AT&T's private wire Tariff 260, as they are filed with the FCC on a selective interest basis, with the Advance Look into Important Rate and Tariff changes (Alirt) service from the Center for Communications Management Inc. (CCMI), 67 So. Franklin Turnpike, 07446.

In addition to general regulations, available Alirt-260 interest categories include teletypewriter, data communications or voice systems, Series 11000 and alternate use arrangements, CCMI said. Mailings, for $2.50 minimum, will be made the week after the filings are made, and should reach subscribers at least 20 days before the changes become effective, CCMI said.

Teleswitchers Tailored to Net Size

DALLAS – Data Users having leased line networks with up to 16 circuits can use Teleswitcher store-and-forward message switching systems scaled to their size from Computer Control Systems, Inc., 13740 Gamma Road, 75240. The Teleswitcher 200 accomodates from 3 to 6 circuits while the Teleswitcher 310 is designed to handle up to 16 circuits, with as many as 384 stations. These models have essentially the same monitoring, interrupt and protect features as larger Teleswitchers previously available.

Both the 200 and the 310 are customized to provide the number of circuits needed. The smaller unit is priced "in the $60,000 range," while the 310 costs from $90,000 to $100,000, CCS said.

Infotron TDM Has Backup Logic Option

PENNSAUKEN, N.J. – A time-division multiplexer with an optical standby central logic unit for automatic backup in case of prime central logic failure, the Timeline 240 TDM from Infotron Systems Corp., 7300 N. Crescent Blvd., 08110, provides users with exceptional system uptime.

The Timeline 240 also supports speed-mixing of input terminals from 37.5- to 4,800 baud, and multiplexed output rates from 1,200- to 240,000 baud, in synchronous or asynchronous modes. A full duplex nine-channel unit is priced at $3,000, while a 24-channel version costs $3,500. The standby central logic unit adds $500 to the cost of either, the company said.

Comments Welcomed

FCC Needs User Ideas to Make Decisions

By Ronald A. Frank
CW Technical News Editor

WASHINGTON, D.C. – "The Federal Communications Commission has a growing responsibility to be responsive to user's needs, but we can only be responsive if we are adequately informed. It is the user's responsibility to get his information to us," Bernard Strassburg chief of the FCC's Common Carrier Bureau told CW.

"There is a certain mystique about us. But we are eager to be approached and to be of help. We especially welcome information that gives us the basis to make decisions, Strassburg added.

Speaking on current issues facing the commission, Strassburg said his staff is "making every effort to come to grips" with the issues affecting interconnection of non-carrier equipment to the phone network. He said a "framework of precedents" by the commission may eventually lead to a simplified interconnection program.

But the FCC staff will continue to pursue the matter, he said, adding that the recently formed PBX study group may have some answers "by the end of this year."

Asked to discuss the quality of service issue recently raised by the FCC staff, Strassburg said his office wants to determine whether common carrier tariffs should include statements detailing the level of service which a user should expect.

The staff will investigate the feasibility of having carriers make such statements to users, he said, and added that this was one area in which comments would be welcomed.

In describing the best type of responses from users, Strassburg said they should address themselves to specific dockets and issues currently before the FCC or its staff, and preferably they should add new opinions. But the commission wants to receive all types of responses, he said.

Asked about the effect of the recently approved competition between the new specialized and the existing common carriers, Strassburg said, "We don't know what types of rate structures will be proposed, but these issues possibly will resolve themselves."

There will be less concern about rate of return but the commission will want to assure that the "Bell System will not stifle or inhibit competition," he said.

Asked whether telephone costs would be allocated on a usage basis Strassburg said that Telex and TWX are now essentially a measured service and Bell's Wats facilities are "more or less" similar. He predicted that there will be a trend toward measured use based on channel bandwidth and time of calls.

Telex Users Able to Access CPUs With U.S. Package, Canadian Net

U.S. and Canadian Telex subscribers are finding increased versatility in their terminals by using the units to access computer data.

Computer Sciences Canada recently introduced a service to small business users that will allow interactive timesharing access to Univac 1108s in Toronto and Calgary via a local Telex call.

The system allows Telex users to access the CPUs at regular CSC rates plus a $15/mo telecommunications computer inquiry service charge from Canadian National and Canadian Pacific (CNCP) which provide the Telex lines and equipment.

Although a $50 initiation charge and a $25/mo minimum fee are also required of users, CSC said the service will allow "unsophisticated" users the capability to use basic 5-level Telex terminals to do accounting, payroll and other necessary functions that would otherwise not justify the installation of an in-house CPU or more expensive interactive terminals.

A Telex subscriber accesses a CPU by calling the local CSC branch which then multiplexes the call into one of the 1108s. A CSC spokesman said that 95% of the estimated 21,000 Telex subscribers in Canada would be able to avoid long distance Telex charges with the service.

By using the CSC Basic Management Information System (BMIS), Telex users can call the CPU for market research, customer analysis, and budget and inventory control, CSC said.

CSC rates are $10/hr for connect time and 60 cent/sec for CPU time. The firm has offices in most Canadian cities.

Similar U.S. Service

A similar service from Management Systems Corp., Dallas also allows Telex terminal users to access 360/40s or larger, but on a more limited basis.

Initially installed at C&H Transportation Co., Dallas, the Traffic/Manage system, an outgrowth of MSC's Manage software system, allows Telex terminals to act as inquiry stations.

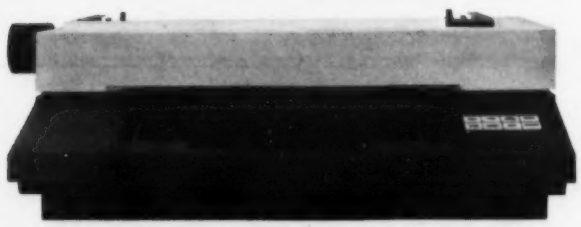
In The C&H application, the trucking firm's 18 Telex terminals can receive routing data on the equipment being sent to various geographic areas. But the Telex units can be used only for inquiry access, and file updating must be done by CRT terminals. One reason for this restriction is the limited error correcting capabilities of the Telex terminals.

The MSC system uses IBM 2702 adapters to convert the 5-level Telex code into 8-level Ebcdic for input into the 360. MSC said it can provide Traffic/Manage either as a package for in-house use or on a facilities management basis using the firm's 360/40. Rates depend on user needs. MSC is at 7007 Preston Rd., Dallas, 75205.

Astroset 300 Modems Include Self-Tests

ST. PAUL, Minn. – The Astroset 300 series modems from Astrocom Corp. are compatible with Western Electric 201 units but also include a self-test mode to check sending and receiving abilities of both the modem and terminal.

The Astroset 320 can replace the WE 201A. It is a 2,000 bit/sec synchronous modem for use on unconditioned private lines or on the switched network through a Data Access Arrangement (DAA). The Astroset 324 is a 2,400 bit/sec replacement for the 201B modem, intended for use with C-2 conditioned private lines only. The Astrosets cost $1,450 each, from 293 Commercial St., 55106.



This is the new Novar 5-40 MOD II. It has both software and communication compatibility with the 2740 Model 2. There is one big difference, however. The 5-40 MOD II transmits at up to 2400 baud.

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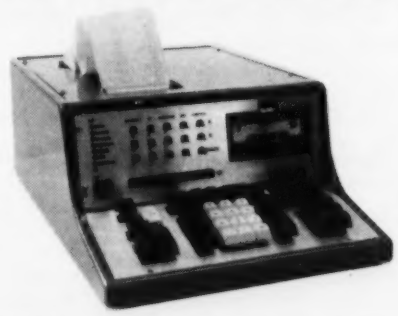

The Tranti Sorcerer source data collection system, or "smart" terminal, includes a keyboard, built-in calculator, program, paper tape printer, magnetic tape cassette recorder, and direct access modem for unattended computer polling. This portable instrument provides a unique, new and better method for off-line entry, processing, storage, and transmission of data at its source.

The Sorcerer is ideal for accounting, insurance collection, inventory control, fast food, and service bureau applications. Simply key account numbers and dollar entries – the recorder verifies, accumulates totals, and stores on magnetic tape. Entries are listed by the printer, and error alarm features guide the operator. Data is automatically transmitted on call from the computer.

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Bits & Pieces

Cogar Add-on 360 Memory Uses Monolithics, Not Core

WAPPINGERS FALLS, N.Y. – Cogar Corp.'s add-on semiconductor memories are now available for 360/30s, 40s, and 50s.

The plug-compatible units are modular for expansion without retrofitting, and a built-in trouble shooting provision permits rapid isolation of faulty circuits while off-line, according to Cogar.

On two year leases, 32K (bytes) for the 30 costs $980/mo, 64K for the 40 costs $1,620/mo, 131K for the 50 costs $3,040/mo.

The Cogar 7065, a replacement for IBM's 2365 add-on memory, will be available in August from Cosby Manor Road, Schuyler, N.Y. 13502.

Documation M1200 Card Reader Reads 1,200 Card/Min

MELBOURNE, Fla. – Documation's M1200 card reader features a reading speed of 1,200 card/min and a capacity of 2,250 cards. Designed for regular 80 column cards, the company says the M1200 offers a reliable and maintenance free card track and card handling mechanism. The unit sells for $7,800, and can be delivered in 60 days from 841 E. New Haven Ave., 32901.

Terminal Displays Two Cases

CORNWELLS HEIGHTS, Pa. – Delta Data Systems Corp. has upgraded its Telterm video display to present both upper and lower case characters using a 7 by 9 dot matrix and a video scanning technique. A terminal costs $3,600, and can be delivered in 30 days. Delta is at the Woodhaven Industrial Park, 19020.

Microfiche Viewer Sells for $169

NEW YORK – The GAF 7504 microfiche reader is specifically designed for COM users. It can accommodate 4 by 6 in or 3-1/4 by 7-3/8 in. computer page format microfiche for viewing at 3/4 size.

Suggested retail price is $169. Information is available from GAF Corp., 140 W. 51st St., 10020.

CRT Unit Is TTY Replacement

TUCSON, Ariz. – The TEC Model 440 Data-Screen CRT terminal is designed as a direct, plug-to-plug replacement for the KSR-33 Teletype unit.

In unit quantities, the display costs $1,950 and the keyboard $165. TEC is at 9800 N. Oracle Road, 85704

Calculators Keep Up Push Into Computer Territory

By Michael Merritt
CW Staff Writer

Two new programmable desk top calculators from Wang Laboratories and Hewlett-Packard are closing the gap between computer and calculator, bringing true data processing power into the $7,000 price range.

Memory as Big as a 30's

The more powerful of the two is Wang's 700C – a calculator that can have – if you want the ridiculous – 512K bits of core memory, the largest memory available on a 360/30.

In a basic configuration, though, the 700C has 122 storage registers and 960 program steps (eight steps take the same memory as one register), a scientific notation feature, and one magnetic tape cassette. This costs $5,200, and memory can be increased in 4K blocks, at $1,500 per block and an additional $1,500 to open a channel for each 32K of memory.

A dual tape cassette peripheral costs $2,500, and the three tapes give the 700C file processing power equivalent to that of a small minicomputer.

Read/write time is 2 μsec, and add time for two 12-digit floating point numbers is 300 μsec.

The 700C can be accessed by 16 time-shared users. Other peripherals include a plotter, a typewriter-printer, and paper tape and card equipment.

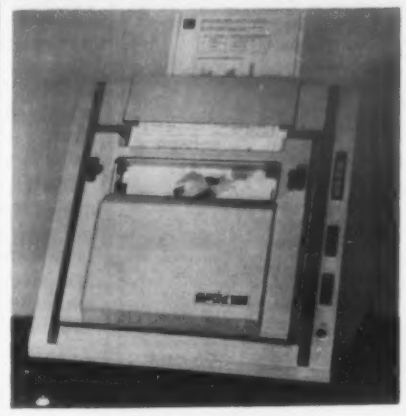
HP's 9800 Model 10 is hampered by a lack of mass storage – tape or disk – and is thus more record-oriented than suitable for file-type business applications.

Program input is through the keyboard or a magnetic card reader, and maximum internal storage is 111 registers and 2,036 program steps – 19K bits.

There are also plug-in pre-programmed memories that define mathematics and statistics functions, and give the optional thermal printer alphabetic capability.

They also permit a user to define his own functions and operate them with one keystroke. Available peripherals include an X-Y plotter, a marked card reader, and a typewriter-printer.

The minimum calculator, with 51 registers and 500 program steps, and without plug-ins, costs $2,975. With maximum memory, plug-ins, printer, and typewriter, the price is in the neighborhood of $7,000.



Mini Printer

Leigh Instruments' $2,450 Alphagraphic printer writes from 120 to 200 line/min or prints graphics at three page/min. Interfaces featuring teletypewriter; compatibility without software change are available for most minis. Leigh is at P.O. Box 2323, Station D, Ottawa 4, Canada.

Data Base Units, Business COM Added to Datagraphix' Products

SAN DIEGO, Calif. – Stromberg Datagraphix has introduced a spate of new COM products, including a system designed specifically for business use, and a computer-driven, off-line data base system.

The 4460 Business Graphix Recorder can be used for high-speed printing of alpha material and graphics, phototypesetting, and roll or microfiche printing – or computer-animated movies.

The $150,000 system uses the standard Datagraphix Universal camera which records on 16, 35, or 105mm microfilm at 24X or 42X reduction ratios. Its programmed recording system accepts data either in an on-line mode or via 7- or 9-track magnetic tape.

All software is supplied with the system.

Recorded microfilm cassettes are the base of the Datagraphix Microsearch System (DMS). Only cross-indexing and update information is filed in the computer, and queries for search keys (names, invoice dates, subject matter, account number, personnel characteristics, and the like) produce lists of cassette and page codes. The proper cassette is loaded by the operator into a DMS terminal, and the terminal automatically advances the microfilm to the first page code.

A strip printer built into the terminal prints any update information on the microfilmed material that the computer has in its memory.

The advantage of the Microsearch system, Datagraphix said, is that it enables users to combine advantages of an interactive, on-line computerized data base with an inexpensive, easily accessed microfilm system.

A keyboard on the terminal is used for coding newly entered data. Average retrieval time is nine seconds, according to Datagraphix. Up to 15 terminals may be multiplexed on one acoustic coupler.

The DMS terminals sell for $11,950, and rent for $650/mo to $420/mo.

Stromberg Datagraphix is at P.O. Box 2449, 92112.

Modcomp I for Process Use

Mini Compatible Through Line

FT. LAUDERDALE, Fla. – The Modcomp I minicomputer, a 16-bit, 800 nsec machine, is hardware and software compatible with the other nine models of the Modular Computer Systems family.

The unit is designed specifically for real-time measurement control and communications applications, with an emphasis on internal speed. Memory is available in core or solid state read-only or random access form, or combinations of all three. Maximum memory size is 16K.

The mini has the capability of later enhancement to speeds of less than 300 nsec. Control lines are also available to permit optional addition of a 300 nsec ROM controller for microprogramming applications.

Bit, byte, and word manipulation are possible on the Modcomp I, as are immediate and displacement addressing and three general purpose registers.

Options designed for real time applications include byte parity, power fail safe, real-time clock, and a direct memory processor.

Standard operating software includes an assembler, loader, utility package and math library, plus a Fortran compiler.

The CPU without memory costs $2,600. Solid state RAM costs $1,800 per 2K increment, and ROM goes for $1,500 for 512 word increments. Core memory costs $2,100 for 2K and $5,200 for 8K. Parity checking costs $500 extra.

Shipments are scheduled to begin in the fourth quarter of 1971 and are on a 60 day delivery basis. Modular Computer Systems is at 2709 N. Dixie Highway, 33308.

Mixed Marriage Works!

The Data Products LARGE CORE STORE and the IBM 360 Computer have been wed. The 360, formerly exclusively engaged to the IBM 2361, couldn't resist the beauty of Large Core Store with four times faster operation at lower cost.

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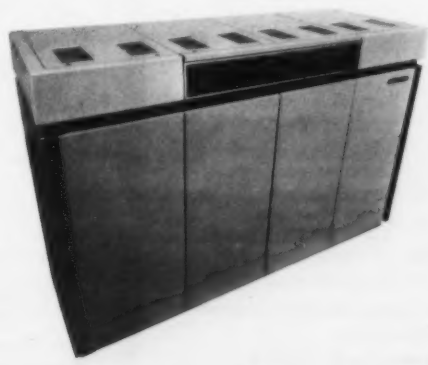

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July 21, 1971

CI Notes

SJCC User Show

MIDDLETON, N.J. – This year's Spring Joint Computer Conference was definitely a user's show, according to Exhibit Surveys here.

The percentage of users visiting the show reached an all time high of 60%, according to the firm, which excluded exhibit personnel from its survey. The joint also had the highest percentage of potential buyers ever, with 54% of the people in attendance planning to buy one or more products in the next year.

IBM Salesmen Out

BOSTON – Several IBM salesmen have been released here reportedly after one placed an order without a customer's permission.

There are two versions to the story: One is that the office was under quota and wanted to get the order in early. The other is that the salesman had assurances the firm would order a 370/145 and wanted to get it an early delivery, which is determined by order date.

Disk Coating Revealed

WALLED LAKE, Mich. – Bryant Computer Products claims a new abrasive resistant coating for magnetic disk and drum surfaces, called Marc 5, will withstand periodic touchdowns of around 12 msec without losing data.

Tests of the surface also revealed that touchdowns of up to 10 minutes duration wiped out data, but caused no damage to either the disks or heads.

Potter Posts Record

MELVILLE, N.Y. – Record orders for the fiscal year ending June 30, 1971 have been received, Potter Instrument Co. said. The purchase price value of new orders for the year amounted to nearly $62 million. In addition to record orders for the year, shipments increased sharply in June 1971, the firm said.

Supershorts

Advanced LSI Technology has signed agreements with Four-Phase Systems, Inc. to become a volume supplier for MOS wafers used in the Four-Phase System IV/70. Advanced LSI shipped its first products for evaluation at Four-Phase in late April

– – –

Periphonics Corp. has signed an agreement with Digital Equipment Corp. for the field service support of the Periphonics Voicepac-2000 audio response system.

– – –

TRW, Inc. and Computer Terminal Corp. have entered an agreement whereby TRW will become the international marketing arm for the terminal maker.

– – –

The Computer Exchange, Inc., has been appointed exclusive Northeast distributor for Information Control Corp.'s CorPak expansion memories.

– – –

A patent has been awarded to Hughes Aircraft Co. for a method of obtaining holograms by means of a single-mode pulsed laser.

Four Types Planned

Boom Seen in Smart Terminal Market

By a CW Staff Writer

NEWTON, Mass. – IBM will set the tone and direction of the intelligent terminal market when it begins delivering its programmable buffered terminal, the 3735, according to International Data Corp.'s *EDP Industry Report.*

The intelligent terminal (IT) market " is probably the fastest growing equipment sector of the computer industry," the report notes.

The market as a whole grew more than 32% in the six month period between yearend 1970 and midyear 1971, the report shows, with a jump in the number of installed terminals from 7,060 to 9,335 during that time span.

Overall intelligent terminals fit into a rapidly growing terminal market in the U.S., IDC notes. Users spent about $250 million during 1970 on terminal hardware out of DP equipment expenditures totaling $5.6 billion.

The percentage of equipment expenditures devoted to terminal hardware is expected to grow to almost 10% of the total equipment outlay by 1975, according to the IDC figures. In 1975, users will spend approximately $975 million for terminal equipment out of computer system hardware expenditures amounting to about $10.7 billion, the report states.

There are presently four types of intelligent terminals on the market, according to the survey, broken down as follows:

"● Remote Batch Terminals. Accounting for half the ITs installed today these devices began as agglomerations of printers and card reader/punches designed to accept and transmit input and output between central computers and a remote site.

"A flood of independents have entered the market with RBTs [remote batch terminals] that can also handle general processing, and this type device will likely fade into other categories.

"● Microprocessors. These country cousins of the IT family are just smart enough to give some help at key-entry stations. As keypunch replacements they take over a limited amount of format and transmission processing.

"● CPU-Controlled Buffered Terminals. Without a mainframe, these devices have at most limited use; with one, they are powerful for automating input. They lead an operator through the procedure of filling out forms, and their memory and logic are restricted to this rote, record-oriented procedure.

"This market segment is the natural stomping ground of the mainframe manufacturers, and Burroughs has done well in this area. Once IBM takes command of this market with its 3735, it could have the greatest growth potential of any IT.

"● Mini-Based Systems. The approach taken by many independent manufacturers, these devices are potentially the brightest and most flexible of the ITs. The expense of the minicomputer holds the price up, though, and the installed base of these systems is lowest.

"But if the minicomputer function is replaced by true, low-priced components watch out – there will be no reason to have anything but such an intelligent terminal."

Mini-based systems accounted for 435 of the installations at midyear 1971, a 76% jump from the 260 installations at yearend 1970. The microprocessor units showed a 110% increase in the same time span, however, from 900 installed units to 1,900 devices in the field.

Remote batch devices only grew by 14% from 3,400 to 4,000, while CPU-controlled devices registered a 20% climb from 2,500 to 3,000 installed, the report indicates.

On the Road

SDC Plans Public Systems Profit

By E. Drake Lundell Jr.
CW Computer Industry Editor

SANTA MONICA, Calif. – The dream of applying technology developed for the defense industry to systems for the public services sector – and making a profit at it to boot – still remains a dream to most defense related software houses.

But to System Development Corp. (SDC), which is virtually a stepchild of the defense establishment, the dream is coming true.

For the fiscal year just ended the firm did about $7.5 million worth of business through its Public Systems Division which is active in such areas as libraries, education, health, public safety, transportation and general government applications.

The results of the operation – which will account for about 16% to 18% of the firm's total revenues when the figures are released – were not enough to make money this year, but allowed the division to break even after three years of operation, according to Dr. Launor F. Carter, division vice-president and general manager.

Next year, however, is another matter. The division presently has a "good" backlog and will make money in public systems in fiscal 1972, he said. The public systems sector should account for between 20% and 25% of the overall company revenues, Carter added.

The most successful area for the firm in the past year was in the transportation and telecommunications segment of the business, he said, with the second largest potential market seen in the field of public safety and police applications.

IBM Quarter Per Share Even; But First Half Sets Record

ARMONK, N.Y. – For the first time since the fourth quarter of 1969, IBM failed to show an increase in quarterly per share earnings during the second quarter of 1971, ended June 30.

However, the firm announced records in all categories for the six months ended on the same date.

The firm admitted that the rest of the year looks unfavorable. T.V. Learson, newly elected chairman, said, "a continuation of the current economic trend is likely to result in somewhat less favorable income comparisons for future 1971 reporting periods."

The stock market reacted quickly to the announcement, dropping IBM common stock to its lowest point this year – $302 per share. At one point in 1971, the stock had traded at over $365.

Revenues inched up almost 4% in the quarter to $1.94 billion from $1.87 billion and earnings were slightly higher at $255.1 million over the $252.1 million in the same quarter a year ago. But the gains were offset on a per share basis due to an increase in outstanding shares, keeping per share earnings at the $2.22 level reached in the second quarter last year.

For the first six months, IBM continued to set records, with earnings rising to $505.9 million ($4.41 per share) from $482.4 million ($4.24 per share) in the first half of last year. Revenues at the halfway point hit $3.81 billion – up just over 6% from the $3.59 billion charted in the same period last year.

Learson said the firm was experiencing satisfactory growth from operations outside the U.S., but that declines in domestic growth slowed an overall gain.

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Request for Proposal No. 43 — Lease of a test scoring machine capable of reading pencil marked answer sheets.
Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority. The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

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Analysis—Part I

LEDs Eliminate COM Problems

By Mark Flomenhoft
Special to Computerworld

A major problem holding back the full development of computer output microfilm (COM) usage is the operational nuisance of recurrent adjustments to COM systems employing cathode-ray tubes (CRTs).

This problem draws complaints from end-users after installations have been made and hands on experience developed.

On the control panel of a typical system there are focusing, positioning, linearity, brightness, size, and astigmatism controls that have to be manipulated; internally there are other controls to maintain as well.

Fairness requires two qualifications at this point. The first is that the more elaborate COMs have been meticulously stablized with compensation and feedback circuits so that adjustments hold over prolonged periods.

Two prominent examples are the Information International FR-80 and the Singer-Link MS-5000, which presently dominate the high-resolution field. In view of the high cost of the many capabilities of these precision instruments, the expense of incorporating tight compensation was not prohibitive.

The resulting stability tends to avert breaks in equipment operation so that true throughput of these systems is somewhat higher and operational costs are somewhat lower than their specifications imply.

The second qualification concerns a clear-cut improvement in the stability of all CRT recorders since the advent of LSI semiconductor technology, which has greatly reduced the cost of compensation. Effective use has been made of the new technology to placate a general demand for better design.

CRT recorders are not being disparaged as intrinsically poor. Indeed, when high resolution is important, or when complex graphics and special features such as multiple fonts, boldface and italic printing, image rotation, underlining, subscripting and superscripting, variable print size, and combined alphanumerics-graphics in a single frame are called for, CRT imaging stands supreme at present and will remain so indefinitely.

The simple fact, however, is that the CRT is inherently a nonlinear device that must be supported by numerous circuit functions and a battery of controls for satisfactory operation.

Is the fault with the circuit components rather than with the kinescope?

The answer is quite simple – it really does not matter whether a decline in performance has arisen from circuit drift or from an aging kinescope. As long as circuit components are there, they are subject to breakdown. As long as a CRT is used, it will slowly deteriorate and ultimately require replacement.

The CRT in digital applications suffers from a basic disadvantage in that its beam deflection voltages (or currents) are inherently analog quantities.

Hence, when beam position specifications are expressed digitally, the information must be translated into analog form before proper deflection signals can be generated. This conversion is not difficult technically, but like any other provision, it must be paid for.

These considerations enable us to identify at least one of the faces of necessity that have confronted the COM industry. The elusive electron beam, so light and free to drift from its prescribed coordinates, must be succeeded by an image technology that is stationary and uniform in character. This new method should also dispense with the need for digital-to-analog conversion.

October 7, 1969, therefore, deserves recognition as a date of historical importance in the COM industry. On this day Memorex announced the 1603 Microfilm Printer and its novel imaging technique of light-emitting diodes (LED) and fiber-optic light conductors. For the first time the image-forming assembly of a COM recorder could be sealed at the factory so that the operator would be left nothing to adjust.

Since the diodes were actuated digitally, digital-to-analog conversion was eliminated as well.

Memorex, however, did not create LED imaging. Apparently credit for this development is due to government R & D, which created the technique to miniaturize small-panel displays.

At one stage Memorex engineers tried to adapt nixie tubes as an alternative to the electron beam, but resolution problems were too formidable. Eventually they turned to the curious luminescent semiconductors of government research and successfully adapted these devices to COM imaging.

This is the first of a series of articles on the use of light-emitting diodes in the COM industry. Mr. Flomenhoft is Associate Editor of Auerbach Graphic Processing Reports.

1971 Registered Business Programmer Examination

Deadline date for filing applications is August 1

The examination will be given in 100 test centers in the U.S. and Canada on Saturday, October 16, 1971. Objective of this program is to stimulate the development of the highest proficiency in business programming.

To the career-minded individual, the examination is an increasingly recognized means for identification as a qualified senior level business programmer.

To corporations, it is a tool for evaluating programmers. It is an effective method for locating, motivating and adequately remunerating business programmers. By anticipating predicted demands for additional programmers in the future, industry may avoid some of the pitfalls of the past decade.

Currently, there are no formal qualification requirements for the examination. Although the program is directed by the Certification Council of Data Processing Management Association (DPMA), applicants do not have to be DPMA members.

Please forward the "Business Programmer Examination Announcement and Study Guide" along with application and test site list.

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No Magic Formula

Only 20% of Time-Sharing Firms Seen Profitable

PHILADELPHIA – There is no magic formula for success in the time-sharing industry, according to a survey of profitable firms in the business conducted by Time-Sharing Enterprises, Inc.

The survey, which identified 28 out of 140 firms in the field, shows that the profitable firms cover a "broad spectrum in size, in geographic area served, and in type of service." Time-Sharing Enterprises said that an additional 7 firms in the business said they were profitable, but did not want to be included in the survey.

The firms, while accounting for about 20% of the organizations offering time-sharing services, garnered almost one-third of the revenues found in the field in 1970, according to the study.

During 1970, the 28 firms accounted for revenues of around $90 million, Time-Sharing Enterprises said.

In general, the report states, the profitable firms "treat remote-computing as a serious business. The many companies which two years ago were climbing on the time-sharing bandwagon as a quick speculation or casual diversification are not among the profitable companies today."

The successful firms have been in operation at least two years or are using systems that are at least that old, the report says, and they "place great emphasis on customer service."

Almost all of the successful firms are "running a surprisingly high percentage of repetitive or production-like work," the survey indicates, and they are all "well-known and respected in their various markets."

Ten of the firms in the profitable column had revenues of between $100,000 and $1 million; 12 were in the $1 million to $5 million range; three had revenues between $5 million and $10 million, and three had sales of over $10 million.

The study reports profits chalked up were not large, but adds: "Profits are difficult to couple with growth, particularly for a new field experiencing rapid technological evolution, and which today charges for its services on a monthly usage basis."

Public companies achieving a profit included: Community Computer Corp.; Computer Network Corp.; Keydata Corp.; MetriData Computing, Inc.; National CSS, Inc.; On-Line Systems, Inc.; Programs and Analysis, Inc.; TransNet Corp.; and Tymshare, Inc.

Divisions and subsidiaries reporting a profit included Avco Computer Services; McDonnell Douglas Automation Co.; Philco-Ford CSN; Stat:Com; and University Computing Co., Network.

The largest group was privately held, including Allen-Babcock Computing, Inc.; APL Services, Inc.; Applied Computer Time Share, Inc.; Chi Corp.; Compu-Time, Inc.; The Computer Co.; Cybernetics Corp.; Dialcom, Inc.; General Computer Service, Inc.; Sci-Tek, Inc.; Scientific Time Sharing Corp.; Structural Dynamics Research Corp.; Technical Advisors, Inc.; and World Wide Time Sharing, Inc.

Honeywell Unit Plans Joint Venture Move For Japan Time Share

TOKYO – Mitsubishi Corp. is planning what is called the "first" time-sharing service to be offered in Japan.

The service, to be operated jointly by Mitsubishi and Mitsubishi Office Machinery, the Honeywell-Bull licensee in Japan, will use two Honeywell 635 computers valued at around $4 million.

The first 635 is already on-site and will initially be used to create a central data base for both companies. The commercial service will not be available until the second system is installed.

The first 635 has 131K main memory, 61 Mchar of disk storage, 12 tape units, in addition to a communications controller, four Terminet printers and six displays. The second unit will have 262K memory.

1,000 Unit United Order Helping Boost Incoterm Toward 7 Fold Growth Rate

MARLBOROUGH, Mass. – With an order of 1,000 terminals from United Airlines, Incoterm Corp. is well on its way to 7- to 8-fold growth over last year, according to Jean Tariot, president.

The order, which calls for the delivery of 1,000 SPD 10/20 programmable display terminals over the next 12 months, comes close on the heals of an agreement with Air France for over $1 million worth of the display devices.

It also comes at a time when the firm was announcing an agreement with Elta Electronic Industries in Israel under which the subsidiary of Israel Aircraft Industries will manufacture $3 million worth of the displays and buy about $1 million more from Incoterm.

In another overseas agreement, the firm recently announced a purchase/manufacturing agreement with CGE Transac in France that calls for a total of $15 million worth of terminals.

Tariot estimated that the programmable terminal market would be worth between $75 and $100 million this year and said that Incoterm expected to capture a 10% share of the revenues.

The present market is dominated by orders with the airlines, he said, but added that other major markets the firm hoped to penetrate included banking and hospital systems.

Presently the firm is producing around 30 to 40 systems a week, but that rate will be doubled by November, Tariot added.

Pert Scheduling Assists Liner

LONDON – Commissioning work for a new cruise ship, the Cunard Adventurer, is being assisted by Pert networks run by Baric Computer Services Ltd. here.

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Honeywell Sets Wire Memory Delivery Dates

ST. PETERSBURG, Fla. – Honeywell has announced the first two orders for the "mini-wire" memory system manufactured by its Aerospace Division here.

The mini-wire system, claimed to be the first to use 2-mil plated wire and medium scale integrated circuits, has been under development by the firm for two years.

The first customer for the system will be Nasa, which will use a 4K (words) 32-bit version of the 200K bit system for evaluation as a possible component for the Space Ultrareliable Modular Computer being planned by Nasa.

The second order comes from the Air Force and calls for a radiation hardened system containing 8K by 24 bits. The system, purchased under a

'NASA's Mini-Wire System

$733,637 contract from the Space and Missile Systems Organization, will be delivered in December.

The Air Force unit will be capable of 1 μsec read and cycle time and 0.5 μsec access time, according to principal development engineer, William England. Mini-wire units have been tested at 180 nsec access time, 250 nsec read and 500 nsec write times, he added.

New Registrations

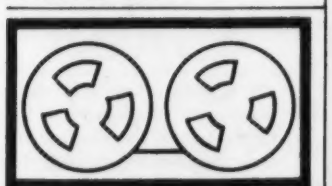
GRI COMPUTER CORP., 320 Needham St., Newton, Mass., manufacturer of general purpose digital computers designed for use as central control devices in larger systems, has filed to register $2.2 million of 7-1/2% convertible subordinated debentures, due 1986. Proceeds are for working capital and corporate purposes. The underwriter is Newton Investment Corp., 141 Milk St., Boston, Mass.

AUTOMATION SCIENCES INTERNATIONAL CORP., 15 Columbus Circle, N.Y., distributer and servicing agent for computers and peripherals of Fujitsu Ltd., has filed to register 400,000 shares of common stock. Proceeds, at $5 per share, intended for purchase of equipment from Fujitsu and for working capital. The underwriter is Mayflower Securities Co., Inc., 32 Broadway, New York, 10004.

INFOREX, INC., 21 No. Ave., Burlington, Mass., manufacturer of peripherals has filed to register 340,000 shares of common stock. Proceeds, at $45 per share maximum, intended to repay short-term loans, and to finance systems for rent. Drexel Firestone, Inc. heads the underwriters.

ULTIMACC SYSTEMS, INC., 1064 River Road, Edgewater, N.J., designers of a business accounting system, has filed to register 125,000 shares of common stock. Proceeds, at $8 per share maximum, intended for marketing and working capital. The underwriter is Cannon, Jerold & Co., Inc., 77 Water St., New York.

ELECTRONIC DATA SYSTEMS CORP., 1300 EDS Center, Exchange Park, Dallas, Texas, has filed to register 69,962 outstanding shares of common stock, to be offered for public sale from time to time by the holders thereof at current prices, $60 per share maximum.



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Acquisitions

U.S. Electronics Corp., Lindhurst, N.J., has been acquired by **Electronic Associates, Inc.** for an undisclosed amount of cash. It will be operated as a division of EAI.

Data-Control Systems Inc., Danbury, Conn., and **All Craft Metals Co., Inc.**, Woodside, L.I., have agreed in principle to the acquisition of All Craft by Data-Control.

Tektronix, Inc., Beaverton, Ore., has purchased the assets of **Cintra, Inc.**, Sunnyvale, Calif., from Physics International Co. The purchase is for cash plus a percentage of Cintra's product sales. Cintra will be known as the Calculator Products Division of Tektronix.

United Data Centers, Inc., has agreed to acquire **Tronics, Inc.** of Montreal for an undisclosed amount of stock.

Harnell Computer Services, Inc. has become Cyphernet System of Illinois, Inc., a subsidiary of **Cyphernetics Corp.**

Brooks International, Inc., Dallas, has acquired the **Brewer Corp.**, a Forth Worth-based manufacturer of heavy line stringing equipment for the utility and electrical transmission industries. Brooks is engaged in computer brokerage activities and computer leasing.

Denman Electronics Corp., Framingham, Mass., has been acquired by **Syntonic Technology, Inc.** Syntonic provides maintenance service for communication and specialized equipment in the medical and computer fields.

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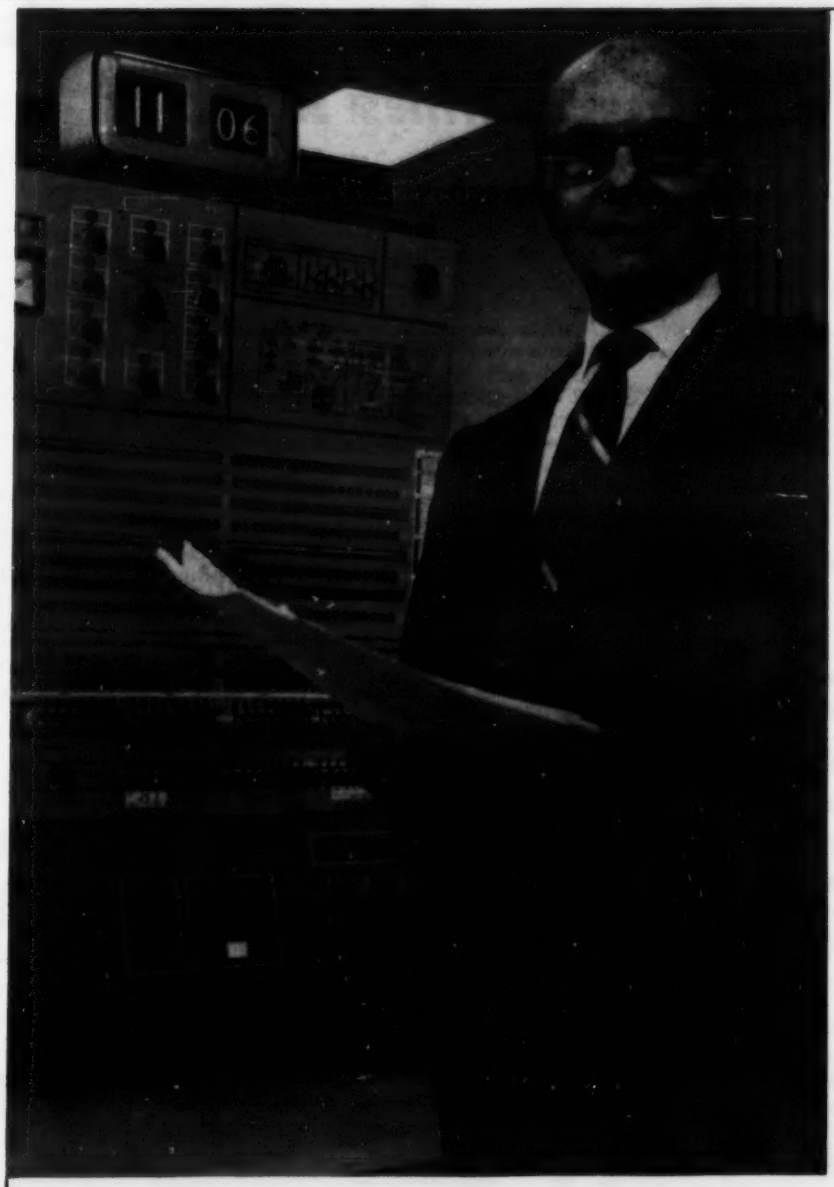

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Best Computer Business Is No Computer Business, Three Earnings Reports Show

By a CW Staff Writer

NEW YORK – Recent six month or fiscal year end reports from two mainframe makers and a large peripherals manufacturer show the best way to make a profit in computers over the last year was to get out of the business.

Of the three firms – RCA, Mohawk Data Sciences and General Electric – only GE showed a profit on computer operations and that came from a sale of stock it acquired from the Honeywell merger.

While RCA showed an earnings gain of 64% for the second quarter and a gain of almost 16% in earnings during the first half of the year, its six month report noted substantially higher losses for the computer division.

The firm earned $19.5 million (25 cents per share) on record revenues of $903.3 million in the last quarter, compared with earnings of $11.9 million (14 cents per share) on sales of $858.9 million in the comparable year-ago time span.

Financial

For the six months, RCA registered $43.3 million (55 cents per share) in earnings on a volume of $1.8 billion, which compares to the half-way figures last year of $37.4 million (47 cents per share) on almost $1.7 billion.

Chairman Robert W. Sarnoff said that the higher losses attributable to the computer division came from start up costs for the introduction of its new computer series and higher development and marketing expenses caused by the firm's goal of gaining a larger share of the computer market. At the same time, Sarnoff reemphasized the firm's commitment to the computer industry and its "long-range growth prospects."

Mohawk 9-Month Year

Mohawk Data Sciences reported a loss of $1.1 million for its fiscal year, ended April 30. The year lasted only nine months, because the firm changed from a July 31 closing to an April 30 basis.

The loss came on a revenue drop to $67.9 million from $74.4 million in the comparable nine month period a year ago. In the nine month period last year, the firm earned $4.5 million (79 cents per share).

During the nine months rental and service revenue jumped from $27.3 million last year to $38.1 million, while outright sales slumped from $47 million to $29.8 million, the firm said.

In the report the firm revealed that it had made adjustments, which resulted in charges of around $5.8 million, resulting in a loss of $2 million offset by a tax credit of around $1 million.

GE, which got out of the mainframe business through the merger with Honeywell, reported record three month earnings of $112.2 million (62 cents per share) for the period ended June 30 – up 14% over the same period last year. Sales for the quarter amounted to $2.33 billion.

Earnings for the six months reached $203.7 million ($1.12 per share) a more than 260% increase over the $55.7 earned in the six month period last year.

The firm noted that the second quarter earnings benefited from the sale of Honeywell stock received in the merger and said that the sale added about 4 cents per share to the earnings picture.

Rand Corp. Recommends Securities Simulation

NEW YORK – The Rand Corp. has recommended the development of a computer model to simulate the trade-completion process in securities dealing after a year and a half study of the securities industry.

The study was undertaken by Rand under a $1.1 million contract with the New York Stock Exchange, American Stock Exchange and the National Association of Securities Dealers, which polices the over-the-counter market.

In addition to the simulation, the study recommends streamlining of a number of current practices to save an estimated $100 million a year.

The computer model would allow the exchanges to experiment with new systems without disturbing on-going operations, the study said.

The other procedures covered in the report are said to be based on initial runs on a preliminary model of the stock exchange operations, Rand said.

A major recommendation called for the establishment of an automated certificate inventory and delivery system. An optional recommendation called for the use of service bureaus to provide data on certificates in brokers' possession so that some sort of priority system could be established for delivery of certificates.

Reduce Transfer Time

The use of computer retrieval of data and the use of partial securities deliveries could speed up stock transfer from the present 8 days to 2 days, the study also said.

The initial steps in the streamlining process could save the securities industry $10 million based on a volume of 13 million shares a day on the New York Stock Exchange, the report said.

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Nickels & Dimes

If you're wondering about action in **Cybermatics, Inc.** stock, here's the reason: The firm was recommended as a buy opportunity for "possible long-term capital appreciation, businessman's risk" by Equity Research Associates and was listed as an over-the-counter market opportunity by Eastman Dillion investment research.

$$$

Typagraph Corp., a manufacturer of terminals, has emerged from bankruptcy court which it entered under Chapter 11 last August.

$$$

A dividend of 10 cents per share has been declared by the directors of **TEC, Inc.**

TRADE*QUOTES

Computerworld Stock Trading Summary

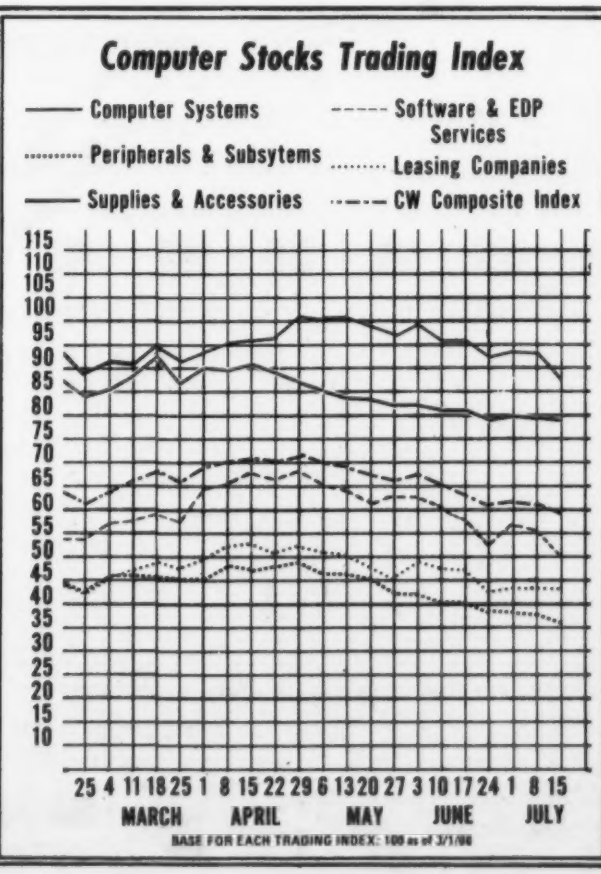
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, JULY 15, 1971

EXCH		1971 RANGE (1)	CLOSE JUL 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	1 3/8	- 1/8	-8.3
A	APPLIED DATA RES.	5- 13	6 3/4	- 1/2	-6.8
O	APPLIED LOGIC	1- 3	7/8	+ 1/8	+16.6
O	ARIES	1- 2	1 1/8	- 1/8	-10.0
N	AUTOMATIC DATA PROC	44- 65	62	-2 7/8	-4.4
O	AUTO SCIENCES	4- 8	5 5/8	+ 7/8	+18.4
O	BOOTHE DATA SYS	1- 2	1 1/4	- 1/8	-9.0
O	BRANDON APPLIED SYS	1- 1	5/8	+ 1/4	+66.6
O	COMPUTER ENVIRON	1- 2	1	+ 1/4	+33.3
O	COMPUTER NETWORK	3- 11	5	+ 1/4	+5.2
O	COMPUTER PROPERTY	6- 11	5 3/4	- 1/2	-8.0
N	COMPUTER SCIENCES	9- 17	11 3/8	-1 7/8	-14.1
O	COMPUTER TASK GROUP	1- 3	2 1/2	+ 3/4	+42.8
O	COMPUTER USAGE	5- 16	8 3/8	- 1/8	-1.4
O	COMP AUTOMOT REPORTS	6- 13	9 5/8	+ 3/8	+4.0
A	COMPUTING & SOFTWARE	27- 45	32 1/2	-4	-10.9
O	COMRESS	2- 4	2 1/2	0	0.0
O	COMSHARE	4- 8	4 5/8	- 1/8	-2.6
O	CONSOL. ANAL. CENT.	1- 2	1 3/8	0	0.0
O	DATA AUTOMATION	1- 4	1 1/2	0	0.0
O	DATA PACKAGING	6- 10	9	+ 5/8	+7.4
O	DATAMATION SERVICE	1- 3	1	- 3/8	-27.2
L	DATATAB	4- 10	7	- 1/4	-3.4
O	DIGITEK	1- 4	1 3/8	- 1/4	-15.3
O	EDP RESOURCES	7- 16	9 3/4	- 1/4	-2.5
A	ELECT COMP PROG	3- 7	3 1/4	- 1/4	-7.1
N	ELECTRONIC DATA SYS.	53- 85	53 3/8	-2 1/4	-4.0
O	INFORMATICS	7- 15	11	-1 1/4	-10.2
A	ITEL	13- 23	12 7/8	- 3/8	-2.8
O	KEANE ASSOCIATES	5- 14	6	0	0.0
O	KEYDATA CORP	9- 14	10	- 7/8	-8.0
A	MANAGEMENT DATA	8- 11	9 7/8	- 1/8	-1.2
O	NATIONAL CSS INC	7- 14	8 1/2	-1 1/2	-15.0
O	NAT COMP ANALYSTS	1- 4	1 1/2	- 1/4	-14.2
O	NAT.COMP. SERV.	2- 4	2	- 3/8	-15.7
N	PLANNING RESEARCH	16- 26	21 1/2	- 1/4	-1.1
O	PROGRAMMING METHODS	18- 29	24 1/2	+ 1/2	+2.0
O	PROGRAMMING & SYS	2- 4	2 1/4	- 1/8	-5.2
L	PROGRAMMING SCIENCES	1- 3	1/4	+ 1/8	+100.0
O	SCIENTIFIC COMPUTERS	2- 3	2 3/8	0	0.0
O	SCIENTIFIC RESOURCES	1- 2	1/2	0	0.0
O	SOFTWARE SYSTEMS	1- 2	1 1/4	- 1/8	-9.0
O	TBS COMPUTER CENTERS	5- 9	4 3/4	- 1/8	-2.5
O	TOLLEY INTL CORP	3- 8	6 3/4	+ 1/8	+1.8
O	UNITED DATA CENTER	2- 7	3 1/4	0	0.0
N	UNIVERSITY COMPUTING	21- 38	27 7/8	-4 1/8	-12.8
A	URS SYSTEMS	7- 11	7 1/4	0	0.0
O	U.S. TIME SHARING	1- 3	1 3/8	0	0.0
O	VORTEX CORP	2- 5	2 3/4	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	40 1/2	-2 1/2	-5.8
O	ALPHANUMERIC	2- 6	2 1/4	- 1/8	-5.2
N	AMPEX CORP	17- 25	17 1/8	-1 3/8	-7.4
O	ASTRODATA	1- 2	1 3/8	+ 3/8	+37.5
O	ATLANTIC TECHNOLOGY	3- 8	4 7/8	0	0.0
A	BOLT,BERANEK & NEW	6- 8	5 7/8	- 3/8	-6.0
N	BUNKER-RAMO	10- 17	11 1/2	- 3/4	-6.1
A	CALCOMP	21- 33	22 3/4	- 3/4	-3.1
O	COGNITRONICS	4- 9	3 3/4	0	0.0
O	COLORADO INSTRUMENTS	3- 8	2 7/8	- 3/8	-11.5
O	COMPUTER COMMUN.	6- 19	10 1/8	- 5/8	-5.8
A	COMPUTER EQUIPMENT	4- 7	4 1/4	+ 1/8	+3.0
A	COMPUTEST	11- 20	10 3/4	-1 1/8	-9.4
O	CONSOL COMPUTER LTD.	8- 12	9 1/8	- 5/8	-6.4
A	DATA PRODUCTS CORP	6- 10	6 3/4	+ 1/4	+3.8
O	DATA TECHNOLOGY	3- 9	5 3/4	- 3/4	-11.5
O	DIGITRONICS	4- 8	4 1/2	+ 1/4	+5.8
N	ELECTRONIC M & M	8- 16	12 1/8	-1	-7.6
O	FABRI-TEK	2- 4	2 5/8	- 1/8	-4.5
O	FARRINGTON MFG	1- 3	1/2	+ 3/8	+300.0
O	FOTO-MEM INC	1- 6	1/4	- 1/2	-66.6
O	INFOREX INC	31- 49	38 1/4	+5 1/2	+16.7
O	INFORMATION DISPLAYS	5- 8	5 5/8	- 1/2	-8.1
O	MANAGEMENT ASSIST	1- 2	7/8	0	0.0
A	MARSHALL INDUSTRIES	17- 27	17 1/8	-2 1/4	-11.6
A	MILGO ELECTRONICS	16- 26	16 3/4	- 3/4	-4.2
N	MOHAWK DATA SCI	23- 47	26 3/8	-2 5/8	-9.0
O	ON LINE SYSTEMS INC	7- 18	11 1/2	-1	-8.0
O	OPTICAL SCANNING	10- 18	10 7/8	- 1/8	-1.1
O	PHOTON	7- 12	8 3/4	- 5/8	-6.6
O	PHOTO-MAGNETIC SYS.	1- 6	2 1/4	- 1/2	-18.1
A	POTTER INSTRUMENT	16- 25	16 5/8	-1 3/8	-7.6
O	PRECISION INST.	7- 16	12	-1 1/2	-11.1
O	RECOGNITION EQUIP	14- 26	16	-1 3/8	-7.9
O	REDCOR CORP.	5- 9	5 7/8	+ 1/8	+2.1
N	SANDERS ASSOCIATES	12- 22	12 1/4	- 1/4	-2.0
O	SCAN DATA	6- 15	11 1/4	- 1/2	-4.2
O	TALLY CORP.	10- 16	9 7/8	- 5/8	-5.9
N	TELEX	14- 22	14 1/4	-1 3/4	-10.9
O	VIATRON	1- 4	1	+ 1/8	+14.2
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	12- 19	12 1/4	+ 1/8	+1.0
O	BALTIMORE BUS FORMS	6- 10	8 1/2	+ 1/2	+6.2
A	BARRY WRIGHT	8- 13	8 1/2	- 3/8	-4.2
A	DATA DOCUMENTS	18- 29	20 3/8	-1 1/8	-5.2
O	DUPLEX PRODUCTS INC	8- 10	8 1/2	- 1/8	-1.4
N	ENNIS BUS. FORMS	9- 13	8 1/2	- 1/8	-1.4
O	GRAHAM MAGNETICS	9- 35	27 1/4	-2	-6.8
O	GRAPHIC CONTROLS	6- 15	11 3/4	- 5/8	-5.0
N	MEMOREX	34- 78	34	-6	-15.0
N	3M COMPANY	96-122	117 1/4	+ 1/4	+0.2
O	MOORE BUS. FORMS	37- 42	40 1/2	+ 5/8	+1.5
N	NASHUA CORP	29- 47	43 3/8	-1 5/8	-3.6
O	REYNOLDS & REYNOLD	37- 58	56 3/4	+ 1/2	+0.8
O	STANDARD REGISTER	19- 23	19 1/2	-1 3/4	-8.2
O	TAB PRODUCTS CO	8- 17	16 5/8	+1 3/8	+9.0
N	UARCO	25- 34	34 1/4	+3 1/2	+11.3
A	WABASH MAGNETICS	7- 10	6 1/2	- 5/8	-8.7
N	WALLACE BUS FORMS	18- 26	22 1/4	0	0.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-138	117 1/2	-10 1/4	-8.0
N	COLLINS RADIO	13- 20	12 1/2	- 3/8	-2.9
N	CONTROL DATA CORP	48- 83	54 3/8	-4 3/4	-8.0
O	DATA GENERAL CORP	19- 50	48 1/2	- 1/4	-0.5
N	DIGITAL EQUIPMENT	53- 85	70	-8 1/2	-10.8
N	ELECTRONIC ASSOC.	5- 9	7 1/8	0	0.0
A	ELECTRONIC ENGINEER.	5- 9	8 1/2	+ 1/2	+6.2
N	FOXBORO	25- 46	40 3/4	-3 1/2	-7.9
O	GENERAL AUTOMATION	11- 26	13	0	0.0
N	GENERAL ELECTRIC	58-124	58 1/2	-3	-4.8
N	HEWLETT-PACKARD CO	30- 45	41 1/4	+ 3/4	+1.8
N	HONEYWELL INC	83-115	95 1/2	-4	-4.0
N	IBM	298-364	298	-13 1/4	-4.2
O	INTERDATA I IC	6- 11	8 1/2	- 3/4	-8.1
N	NCR	38- 49	42 5/8	-1 3/4	-3.9
N	RCA	26- 41	34 5/8	+ 1/8	+0.3
N	RAYTHEON CO	27- 46	37 3/4	+1 3/8	+3.7
O	SCI. CONTROL CORP.	1- 2	1	- 1/8	-11.1
N	SPERRY RAND	25- 38	31 1/8	-2 5/8	-7.7
A	SYSTEMS ENG. LABS	10- 18	11	- 1/4	-2.2
N	VARIAN ASSOCIATES	13- 18	14	-1	-6.6
N	VICTOR COMPTOMETER	15- 27	16 3/4	- 3/4	-4.2
N	WANG LABS.	29- 50	42 5/8	+ 1/8	+0.2
N	XEROX CORP	85-119	116 1/2	-2	-1.6
	LEASING COMPANIES				
A	BOOTHE COMPUTER	13- 27	20 1/8	+ 1/2	+2.5
O	BRESNAHAN COMP.	2- 4	3 3/4	+ 5/8	+20.0
O	COMPUTER EXCHANGE	4- 9	5 3/8	+ 5/8	+13.1
A	COMPUTER INVSTRS GRP	8- 14	10 3/4	-1	-8.5
N	DATA PROC. F & G	11- 19	12 3/4	-1 1/8	-8.1
O	DATRONIC RENTAL	2- 4	2 1/2	0	0.0
A	DEARBORN-STORM	24- 44	41 1/2	- 1/4	-0.5
A	DIEBOLD COMP. LEAS.	5- 13	9 1/4	- 1/4	-2.6
A	DPA, INC.	4- 8	7 1/2	+ 1/4	+3.4
A	GRANITE MGT	8- 13	7 1/2	- 7/8	-10.4
A	GREYHOUND COMPUTER	7- 11	7 1/8	-1 1/8	-13.6
N	LEASCO CORP	16- 23	17 1/2	0	0.0
O	LECTRO MGT INC	2- 5	2 5/8	- 1/4	-8.6
A	LEVIN-TOWNSEND CMP	5- 9	6 1/8	+ 3/8	+6.5
O	LMC DATA, INC.	1- 1	3/4	0	0.0
O	NCC INDUSTRIES	3- 8	7 3/4	0	0.0
O	SYSTEMS CAPITAL	3- 7	6 1/4	- 5/8	-9.0
N	U.S. LEASING	16- 30	29	-1	-3.3

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES AR I BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/66

Earnings Reports

REDCOR
Nine Months Ended March 28

	a1971	b1970
Revenue	$4,906,000	$4,649,000
Loss	2,379,000	2,520,000

a-Reflects change in accounting method on major product lines from recognition as sale to recognition as financial transaction. b-Restated to reflect acquisition on pooling-of-interest basis and sale of subsidiary.

COMPUTER MACHINING TECH.
Nine Months Ended May 31

	1971	1970
Shr Ernd	.....	a$.05
Revenue	$912,428	1,783,249
Spec Cred	.....	10,757
Earnings (Loss)	(225,263)	b27,526

a-Based on income before special credit. b-Equal to 8 cents a share.

MANAGEMENT DATA
Three Months Ended May 31

	1971	a1970
Shr Ernd	$.13	$.20
Revenue	2,342,227	2,449,514
Earnings	140,486	203,221

a-Includes sales of $342,484 and earnings of $53,134, or 5 cents a share, from discontinued operations.

MOHAWK DATA SCIENCES
aYear Ended April 30

	1971	1970
Shr Ernd	.....	$.79
Revenue	$67,890,000	74,366,000
Earnings (Loss)	(1,050,000)	4,486,000

a-The year April 30 figures cover a nine month period in both years but are considered year-end since the company changed its fiscal year to end April 30 from July 31.

RCA
Three Months Ended June 30

	1971 (000)	a1970 (000)
Shr Ernd	$.25	$.14
Revenue	903,300	858,900
Earnings	19,500	11,900
6 Mo Shr	.55	.47
Revenue	1,811,400	1,695,200
Earnings	43,300	37,400

a-Restated by company.

INFOTRONICS
Year Ended March 31

	1971	1970
Revenue	$5,588,561	$5,824,401
Spec Chg	a28,600	b60,567
Loss	1,362,833	670,530

a-From sale of assets. b-Writedown on research and development.

ANDERSON JACOBSON
Year Ended March 31

	1971	1970
Shr Ernd	.....	a$.16
Revenue	$2,354,961	3,421,107
Earnings (Loss)	(108,554)	303,072

a-Based on average common and common equivalent shares.

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- instructions on how to properly analyze your current keypunch department facilities and needs
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